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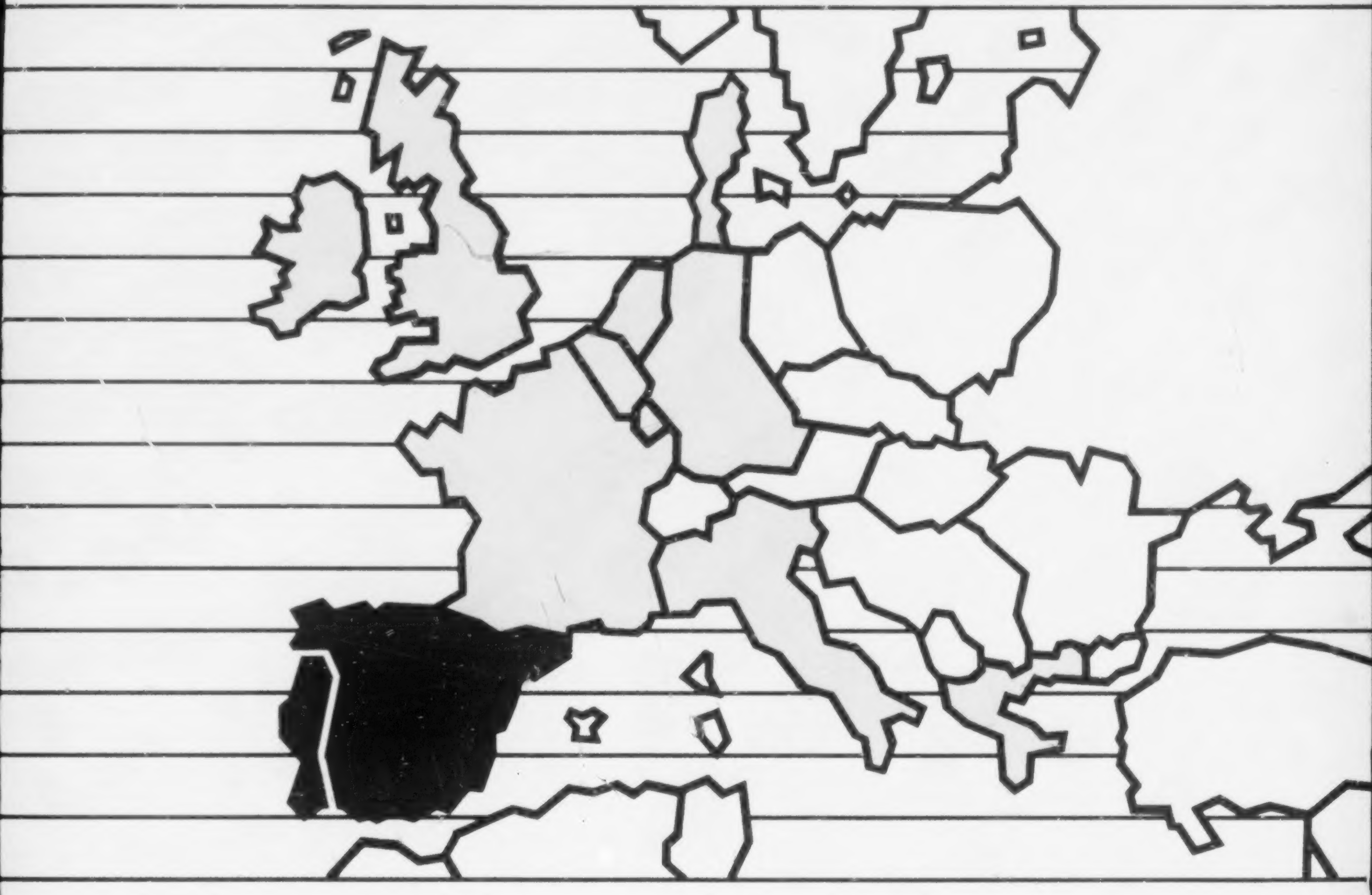
World Food Trade and U.S. Agriculture, 1960-1985

European Community Expands



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Abstract

World grain and oilseed production set new records in 1985-86, while grain exports fell to the lowest level since 1978-79. That produced rapidly rising world carryover stocks; sharply increased costs of government farm programs in the European Community, United States and other countries; a continued drift toward trade protectionism and trade policy conflicts; and one of the most dramatic changes in U.S. farm policies in half a century. Much of the increase in world carryover stocks in 1986 is being stored under government programs in the U.S., and the U.S. shares of world exports of many major farm commodities continued their downward trend in 1985-86. To halt the decline, U.S. price support levels for 1986 crops have been reduced sharply, while impact on farm income is being tempered through the target price system. The U.S. export enhancement programs also are expected to be expanded substantially in the next few years.

Changing U.S. farm policies along with growth in the economics of oil importing nations should encourage modest growth in the volume of U.S. agricultural exports in the next few years. The growth rate, however, will be tempered by debt problems of developing nations and depressed economic conditions in oil exporting countries. Lower U.S. price support levels and large world supplies appear likely to be a depressing influence on world grain prices as well as the value of U.S. agricultural exports in the late 1980s. Appropriate agricultural policies might focus on causes of slow growth in world trade and means of avoiding a trade war.

Key words: Grain, oilseeds, corn, soybeans, wheat, agricultural exports, global food, world agricultural trade, U.S. trade, trade policies, agricultural imports, Soviet grain imports, Chinese grain imports, world livestock production, variable levies, threshold prices, and EC enlargement.

By Robert N. Wisner, professor of economics, and Tahereh Nourbakhsh, graduate research assistant, Department of Economics. Edited by Joy Banyas, communication specialist, Cooperative Extension Service.

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102 E. O. Building
Iowa State University
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Foreword

The World Food Institute of Iowa State University was established in 1972 by the Iowa State Board of Regents to focus the university's "competencies and leadership upon the provision of adequate and nutritious food supplies for the world's peoples through research and education." An annual report of the changing patterns of world food trade and their implications for U.S. agriculture was recommended by the Faculty Policy Committee of the World Food Institute in 1980. Its purposes are: (1) to disseminate a comprehensive but understandable picture of the world food situation, the role of U.S. agricultural exports in world trade and the impact of trade on U.S. agriculture; and (2) to identify emerging issues that will influence U.S. and world agricultural trade. It is intended to serve as a resource for scholars and citizens, for producers and consumers, for policymakers, and for others who are concerned with alleviating the world's food problems. Robert N. Wisner, professor of economics at Iowa State University, has directed this project from the beginning.

The first edition, *World Food Trade and U.S. Agriculture, 1960-1980*, was published in 1981 in conjunction with the first World Food Day. The sixth edition extends analysis of patterns of food trade into mid-1986 with projections into 1987 and beyond. The World Food Institute is pleased to continue its publication and distribution.

World supply of major agricultural products continues to exceed world demand and world stocks of food and feed grains will increase again this year, according to the authors of this edition. As the U.S. shares of corn and wheat exports decline, carryover stocks in this country account for a larger and larger proportion of the total world stocks. The costs of storing these increased stocks is an additional burden.

Competition among food and feed exporters has intensified. Greater and greater pressure for protectionist measures is being exerted by commodity-based organizations not only for grain products but also for livestock, dairy and poultry products and industrial goods. At the same time, food shortages still exist in the world's poorest nations who therefore are increasingly concerned about food security.

The drift toward trade wars fueled by export subsidies is a cause for concern, but so are the depressed prices for farm products and the large U.S. trade deficits. This report will provide background to understand the development of the current world food trade situation and the relationships of U.S. agriculture and agribusiness with the world financial system, currency exchange rates, energy prices, and trade policies of other nations. The authors suggest that the downward trend in U.S. agricultural export volume may be near an end and that U.S. farm products will compete somewhat more successfully in the export market within the next few years.

With the fifth annual edition of *World Food Trade and U.S. Agriculture*, a reader response questionnaire was inserted. We appreciate the responses and additional comments sent back. They were encouraging for the most part and constructive. They will be considered for implementation in future editions. We welcome comments from readers at any time. Send remarks to me or to Dr. Wisner.

Charlotte E. Roderuck
Director, World Food Institute
Iowa State University

Summary and Implications

The world food situation in 1985-86 reflected a continued long-term upward trend in production, a slight decrease in utilization, and sharply rising global carryover stocks of grains, oilseeds, and vegetable oils. Decreased grain utilization, according to estimates by the U.S. Department of Agriculture, occurred in Argentina, Australia, Eastern Europe, USSR, and China, and more than offset increased utilization in several other areas. While world production continued to increase, its growth rate was slightly below the average of the last decade and reflected less favorable weather than in the previous year in parts of Europe, Australia, Argentina, and China. As has been the typical pattern in years of surplus supplies, much of the world's excess grain production has accumulated under various U.S. government storage programs, and U.S. carryover stocks are much larger relative to annual utilization than in other nations. At the global level, grain stocks are equivalent to approximately 20 percent of annual utilization, while U.S. wheat and corn (maize) stocks are equivalent to approximately 95 and 61 percent of total domestic utilization and exports.

The decline in world grain exports in 1985-86 was the largest on record according to preliminary estimates, and was due to sharply reduced Soviet imports as well as growing self-sufficiency of several previously large importers and sluggish economic growth in other importing nations. U.S. shares of world wheat and coarse grain exports continued to decline in 1985-86, maintaining the downward trend of the past four or five years. Declining American wheat export shares reflected increased trade shares obtained by the European Community (EC), Australia, and Canada. The U.S. coarse grain export share declined, while those of EC, China, and South Africa increased. Total Western European and South American shares of world soybean meal trade declined slightly, while the U.S. soybean meal and soybean shares increased in 1985-86, according to preliminary estimates.

Early indications point to a possible small decline in global grain production in 1986-87, with sharply lower world prices generating a modest expansion in utilization and exports. However, since 1985-86 production exceeded utilization by 5 percent or 80 million metric tons, even the combination of slightly reduced production and increased utilization is not expected to prevent a further rise in global stocks in 1986-87. Early indicators point to some possible decrease in grain production in the U.S. because of substantially increased government incentives to remove land from production, and in USSR because of less favorable weather.

Longer-term economic indicators, including fiscal and monetary policy of industrial nations and public and private debt burdens in developing and developed nations, suggest the world economy will grow at a modest rate during the next few years. That, along with lower interest rates than in recent years, reduced inflation, and sharply lower energy costs, should encourage modest growth in world utilization and exports of farm products. However, the growth rate may be restrained by reduced incomes and foreign exchange earnings of oil exporting nations. In 1984-85, nearly half of U.S. corn exports and one-third of U.S. wheat exports (including those sold to USSR) went to petroleum exporting countries. Unless major weather problems develop over a wide area, the emergence of new crop production technology and wider application of currently available technology appear likely to maintain the long-term upward trend in global crop production through the late 1980s and early 1990s.

These prospects indicate that competition in world grain markets is likely to remain intense for the next few years. In the current world economic environment, grain exporters are facing intense pressure to maintain or expand their respective shares of world trade in order to maintain incomes of farmers and avoid costs of storing huge carryover stocks. These same pressures also exist in world markets for livestock, dairy, and poultry products as well as industrial goods. The net effect has been the emergence of one of the strongest predatory and protectionist trade environments since the late 1920s and early 1930s, with a danger that major farm product exporters will slip into a trade war that will spill over into industrial products. Evidences of this environment include sharply increased export subsidies and export enhancement programs by U.S. and EC, threats of import restrictions to be imposed by U.S., EC, Canada, and other nations, and strong negative sentiment toward industrial product imports into the U.S.

This environment creates a need for caution in implementing policies related to trade and export subsidies. The lessons of the 1930s are a reminder that protectionist trade practices can lead to shrinking export markets and declining global economic activity. Similarly, a possible export subsidy war carries the threat of a downward spiral in world farm product prices as some participants use increasingly large subsidies to expand their shares of a static export market and solve domestic farm problems with other participants being equally aggressive in defending their market shares.

The current world agricultural situation and prospects for the next few years suggest that an immediate return to the agricultural environment of the 1970s is unlikely. Instead, several more years may be required to bring equilibrium in the world supply and demand for major agricultural products and significantly improved farm product prices. However, the downward trend in U.S. agricultural export volumes may be nearing an end as a result of sharply reduced U.S. price support levels. Lower U.S. prices and recent weakness in the exchange rate of the U.S. dollar should at least slightly improve the competitiveness of American farm product exports in the next few years, and should bring some expansion in domestic and foreign livestock and poultry feeding. These trends also appear likely to be reinforced by a gradually expanding world economy in the late 1980s.

In dealing with U.S and global agriculture problems and formulating appropriate policies, important linkages between agriculture and the general economy should be recognized. Trade is a two-way relationship in which one partner's purchases generate revenue to provide a purchase and trade flow in the opposite direction. For example, clothing that U.S. consumers buy from southeast Asia or oil purchased from Mexico provides foreign exchange that those nations can use to buy U.S. farm products. The size of the resulting purchases is influenced by the health of the U.S. and world economy, exchange rates, interest costs and their impacts on foreign nations, and a number of other factors. Resolution of current U.S. and world agriculture problems will require monetary and fiscal policies aimed at stabilizing currency exchange rates and interest rates at realistic levels and promoting sustained economic growth.

Even in a setting of global abundance and somewhat improved African crops in 1985-86, food shortages remain a serious problem in the world's poorest nations. Food security in a sizable part of the developing world thus is still an important agricultural policy issue and should not be overlooked in facing the problems of agricultural abundance in developed nations.

Introduction

In mid-1986, the world economy was continuing its drift toward a trade war encompassing increased export subsidies, import tariffs, and quotas to shield domestic producers from foreign competition, income support measures to hold domestic producer prices above world levels, special export financing programs, and a downward spiral of commodity prices. To a large extent, these developments are originating from a depressed global agricultural economy and a record U.S. trade deficit in nonagricultural sectors. Rising world agricultural production and static export demand have depressed prices for farm products to levels not seen since the mid-1970s. The resulting economic problems of farmers and agribusinesses, and problems of storing surplus production, have generated intense pressure for major farm product exporting nations to expand their respective shares of a steady to declining total export market. Pressures to expand U.S. agricultural exports also stem from a record nonagricultural trade deficit, due at least in part to imbalances in U.S. monetary and fiscal policy. So far, the U.S. has been much less successful than other exporters in maintaining its export market shares of major crop and livestock products.

These pressures have caused a three-dimensional reaction in U.S. policies. The first dimension is the most dramatic change in U.S. agricultural price support programs in many years, with sharply lower price support levels, increased direct government income support to farmers, and mandates from the U.S. Congress to sharply expand various export enhancement programs. The second dimension is stepped-up pressure on several nations including Japan and EC to reduce their import restrictions on U.S. agricultural products. Dimension number three is rapidly growing pressures in the U.S. to restrict imports of various foreign products, many of which are nonagricultural, in an attempt to reduce the huge U.S. trade deficit and protect domestic industries. These latter pressures are coming from the U.S. Congress and affected industries. To some degree, these various pressures are pushing the U.S. away from its traditional post-World War II position of seeking and encouraging fewer restrictions on international trade.

In the world food picture, global supplies are large and growing, with record carryover stocks creating storage problems in several countries. African food problems have eased some in the past year with improved weather and crop production, but still remain serious in several sub-Saharan countries. India and China are continuing as exporters of grain and have recently been joined by Saudi Arabia and several other small grain producing nations. The European Community (EC) was enlarged on January, 1, 1986, to include Spain and Portugal. Extension of EC agricultural policies to these two nations is expected to reduce their imports of U.S. grain over the next several years, and will increase EC self-sufficiency in several farm products. This is an additional factor moving the U.S. in the direction of more aggressive trade policies.

In this setting, U.S. farmers, policy makers, and agribusiness managers face several key questions as they plan for the future. Major questions include:

1. What are the forces causing increased foreign production and reduced export demand for U.S. farm products?

2. How long will these forces persist?

3. Can the five-year down-trend in U.S. agricultural export shares be reversed by the agricultural policy changes specified in the U.S. Food Security Act of 1985?

4. What are the long-term prospects for growth in global demand for and supply of farm products?

5. What U.S. and world economic policies are appropriate for dealing with depressed U.S. and global agriculture trade, balancing world supply and demand for farm products and providing adequate world food security?

This report is intended to bring into focus the complex linkages between U.S. agriculture and the world economy, and to trace the impacts of the current world food situation on U.S. farm product exports. It also has as its objective to outline major causes of the intense competition in export markets and to provide historical perspective on the development of that competition. Information provided here is intended to at least partly answer the key questions noted above, and to identify relationships of U.S. agriculture and agribusiness with the world financial system, energy prices, currency exchange rates, and domestic and trade policies of other nations.

1985-86 World Food Situation: Record Production, Sharply Lower Trade, Record Stocks, and Dramatic U.S. Policy Shift

The world food situation in 1986 reflects stresses on global agriculture resulting from abundant aggregate world grain, oilseed, and livestock product supplies. World grain production set a new record high in 1985-86 for the second consecutive year, while world trade recorded the sharpest decline on record. Aggregate trade in all grains plunged 11 percent below the previous year, to the lowest level in 9 years. Sharply declining trade brought increased stress on agricultural producers, farm supply and marketing firms, and agricultural lending institutions in the U.S. and several other major agricultural exporting nations. In the U.S. the net agricultural trade balance dropped to the lowest level in 13 years. Major U.S. agricultural policy changes were implemented by means of the 1985 Food Security Act in an effort to halt the decline in U.S. farm product exports. Changing U.S. policies will have substantial implications for agricultural producers, handlers, and government price support operations, not only in the U.S. but in many other grain-producing nations as well.

Other developments in the world agricultural scene include: (1) rising costs of government farm programs in the U.S., Western Europe, and other areas;
(2) expansion of the European Community to include Spain and Portugal, with resulting grain and oilseed trade restrictions by those two major grain importers; (3) a slight easing of the international debt problem of oil importing nations due to lower interest rates and reduced petroleum prices;
(4) sharply reduced purchasing power and a worsening of debt problems in oil exporting nations; (5) some easing of input costs in U.S. agricultural production including those for fuel, fertilizer, some chemicals, land rental rates, and used farm machinery; and (6) a sharp decline in the exchange rate of the U.S. dollar against West European and some Far East currencies. These developments appear likely to have a net positive impact on the competitive position of U.S. farm product exports in the next few years, although a return to the sustained rapid export growth rates of the 1970s appears quite unlikely in the immediate future.

African food shortages eased some in 1985-86 but remained serious in several countries as well as in parts of Latin America and other developing nations. Despite relatively plentiful world supplies, there is a continuing long-term challenge in meeting the food needs of these nations.

Expansion of the European Community (EC), a declining volume of world food trade, and decreasing U.S. shares of global trade brought the U.S. and EC closer to a trade policy confrontation in 1985-86, with potential negative impacts on other grain exporters. These same conditions also have led to continued U.S. urging of Japan to further reduce its import restrictions on farm products.

World Grain Trade Lowest Since 1978-79

Table 1 shows the world supply and utilization of all grains in 1985-86 and comparisons with recent years. Preliminary data indicate aggregate world grain trade declined by 17 percent or 38 million metric tons from the previous season's record level, thus reducing global grain trade to the lowest level in seven years. Much of the decline was accounted for by a sharp decline in Soviet grain imports from the previous year's record level. Lower Soviet imports in part reflected a moderate improvement in its 1985 crops after major grain and forage production problems the previous year, which sharply increased its 1984-85 import requirements.

World grain utilization declined slightly in 1985-86, reversing an upward trend in usage that had been maintained for 10 consecutive years. Aggregate world utilization declined by an estimated 0.6 percent, thus reducing per capita world grain production by slightly more than 2 percent. Decreases in grain utilization are estimated to have occurred in Eastern Europe, USSR, People's Republic of China, Australia, and Argentina during the trade year. At the same time grain utilization continued a slight to modest upward trend in Western Europe and a number of developing nations but remained approximately constant in the U.S., where increased grain processing offset declining use of grain as livestock feed. World grain production in 1985-86 set a new record at 1,661 million metric tons, 1.2 percent above the previous season and one-third larger than a decade earlier. The growth in production thus was slightly less rapid than the average for the previous decade and lagged slightly behind world population growth. Grain production fell below the previous year in China, parts of Western and Eastern Europe, Australia and Argentina in 1985-86 as a result of less favorable weather. However, reduced production in these areas was more than offset by larger grain crops in U.S., USSR, Canada, South Africa, Bangladesh, and several other developing nations.

With record production and declining utilization, global grain carryover stocks continued to trend upward in 1985-86 for the third consecutive year. Preliminary data place world grain stocks (excluding those in USSR, China, and certain other centrally

Table 1. Combined World Supplies, Utilization, Trade, and Stocks of All Grains in 1985-86, Projections for 1986-87 and Comparisons with Selected Recent Years in Millions of Metric Tons.

July-June Trade Years	Production	Utilization	Trade	Ending Stocks[a]	Stocks as % of Utilization
Projected					
1986-87	1,643	1,615	194	348	21.6
Preliminary					
1985-86	1,662	1,584	181	320	20.2
1984-85	1,643	1,594	219	242	15.2
1983-84	1,484	1,554	206	193	12.4
1982-83	1,543	1,509	201	263	17.5
1981-82	1,498	1,461	210	229	15.7
1980-81	1,447	1,252	215	191	15.2
1979-80	1,427	1,450	198	207	14.3
1978-79	1,466	1,436	177	231	16.1
1976-77	1,363	1,310	158	201	15.3
1971-72	1,197	1,179	110	183	15.6
1966-67	1,006	980	104	169	17.2
1960-61	846	832	72	199	24.0

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-86, July 1986. Includes wheat, milled rice, and coarse grains.

[a] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

planned nations) at 20 percent of total annual utilization, slightly above the level generally considered adequate for world food security.' As has been the usual pattern when world production exceeds utilization, a sizable part of the increase in world grain stocks is occurring in the U.S. where grain stocks are accumulating under various government programs. Rising carryover stocks placed sharp downward pressure on U.S. and world grain prices in 1985-86, with further weakness in prices being possible in the 1986-87 trade year if growing conditions are average or better in most major grain-producing regions of the world.

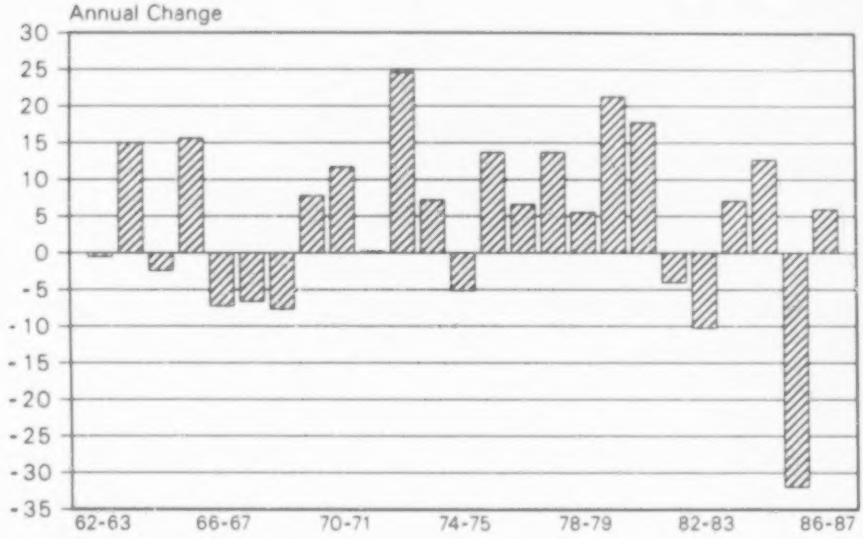
Figure 1 compares the change in 1985-86 world grain exports with the pattern of the past two and one half decades. The decline in exports in the trade year just ending is approximately three times as large as the previous record decline in 1982-83 and nearly four times as large as the sharp declines in trade that occurred in the mid-to-late 1960s.

Short and Intermediate Term Prospects

The U.S. grain production in 1986 appears almost certain to drop moderately below its record 1985 level as a result of U.S. government policies designed to encourage American farmers to remove land from production and the likelihood that yields will be somewhat reduced from the 1985 record levels. Early reports indicate Soviet winter grain prospects are below last year, and that nation has shown a strong tendency toward an alternating pattern of favorable crops followed by less favorable production the next year. In addition, early indicators point to some possible decline in Australia's grain harvest in 1986-87. Reduced crops in these areas may offset or partially offset improved production in areas that experienced adverse weather last season, and may temporarily slow or halt the upward trend in global grain production in the year ahead. However, improved crop production and management practices, and wider geographic application of currently available technology appear likely to maintain the long-term upward trend of global grain yields and production in the late 1980s and early 1990s.

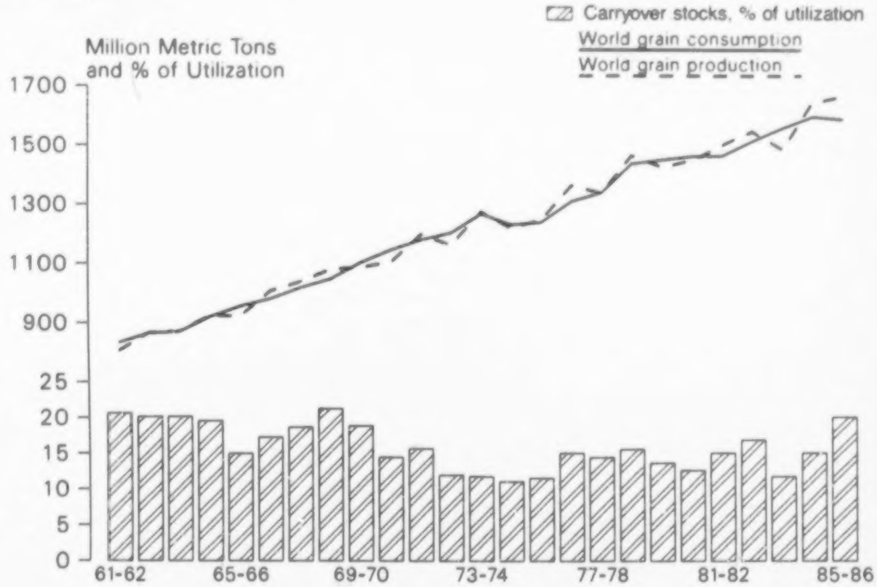
World consumption appears likely to continue its long-term upward trend as a result of growing world population, and a slight stimulus to world economic growth stemming from lower energy costs and interest rates (see Figure 2). However, several major

Figure 1. Annual Change in Total World Grain Trade, 1962-63 through 1986-87 in Millions of Metric Tons.



Source: Compiled from U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 5-86 (Washington, D.C.), May 1986.

Figure 2. World Grain Production and Consumption in Millions of Metric Tons, and Carryover Stocks as Percentage of Annual Consumption, July-June 1961-62 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 5-86 (Washington, D.C.), May 1986 and various other issues.

importing nations have increased domestic grain production, thus reducing their grain import requirements. This trend appears likely to continue in the next few years and will likely hold growth rates in world trade well below those of the 1970s for the next few years. Growth trends and stability of world grain trade also will be influenced by the success of recent policy changes in USSR that are designed to stimulate lagging productivity in its grain sector. Soviet imports currently are large, highly variable from year to year, and are a major influence on the level of aggregate world grain trade.

World Wheat Production Down but Stocks Continue to Rise in 1985-86

World wheat production declined slightly in 1985-86 with reduced production in Argentina, China, and parts of Eastern and Western Europe. However, with the preceding year's production modestly exceeding global utilization and with a decline in 1985-86 utilization, global wheat stocks continued the upward trend of the past five years, both in absolute size and as a percentage of annual world utilization (see Table 2).

The decline in utilization at least temporarily reversed a steady upward trend in world wheat utilization that had been in place since 1975-76. Preliminary data indicate wheat utilization declined in the 1985-86 trade year in the U.S., China, Eastern Europe, Australia, and Argentina, but increased in most other major-producing nations. Global wheat utilization, while down an estimated 1.2 percent from the previous year, was still the second highest on record and was up 38 percent from a decade earlier.

World wheat carryover stocks, in absolute terms, are establishing a new record in the trade year just ending. When related to annual utilization, however, the stocks appear somewhat smaller. They represent approximately 25 percent of annual utilization, the largest since 1976-77 but still below the 30 to 38 percent level of the late 1960s. Much of the build-up of wheat stocks during the past year occurred in the U.S., with U.S. carryover stocks up 12.6 million metric tons and global stocks estimated to be up 8 million tons. Wheat carryover stocks are estimated to have decreased during the year in the EC, Australia, and Argentina, three major non-U.S. exporters. Stocks are believed to have remained approximately constant in Eastern Europe and China, but increased slightly in India and USSR.

The sharp buildup of U.S. wheat stocks also reflected a shrinking U.S. share of the world wheat trade in 1985-86. Wheat exports by the U.S. fell by 13.1 million metric tons or 34 percent during the year, while total non-U.S. exports declined by only 12 percent or 8.3 million metric tons (see Figure 3). Thus the U.S. share of global wheat trade declined from 35.6 percent the previous year to 29.2 percent in 1985-86.

The sharply declining U.S. trade share was one of several factors triggering a major change in U.S. agricultural policies including sharply lower price support levels, increased direct government payments to farmers, and expanded export enhancement programs. A sharply declining U.S. share of global wheat trade also is one of a number of factors contributing to heightening tensions between the U.S. and the EC over trade policies and EC export subsidies. The first test of the effectiveness of changing U.S. trade and farm policies will be during the last half of 1986, when the $.90 per bushel ($33.12 per metric ton) decrease in the U.S. price support level and an accelerated Export Payment-in-Kind program begin to impact on world wheat markets and the competitiveness of U.S. wheat.

World Coarse Grain Supplies Continue to Rise, Stocks Set New Record

Global coarse grain (feed grain) production surged sharply upward in 1985-86 for the second consecutive year, with total output rising 4.2 percent above the previous year and 15 percent above the level of five years earlier (see Table 3). Much of the increase in production reflected exceptionally high yields in the U.S., with its coarse grain output up 36.6 million metric tons and world production up 33.8 million tons from 1984-85. Other countries reporting increased coarse grain production in 1985-86 included Canada, South Africa, Thailand,

Table 2. World Wheat Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1986-87 and Selected Recent Years.

July-June Trade Years	Production	Utilization	U.S. Exports	Non-U.S. Exports	Total Trade	Ending Stocks[a]	Stocks as % of Utilization
Projected							
1986-87	504.0	503.1	30.5	61.0	91.5	125.3	24.9
Preliminary							
1985-86	502.4	494.4	25.0	60.5	85.5	124.4	25.2
1984-85	515.6	500.2	38.1	68.8	106.9	116.4	23.3
1983-84	490.9	486.4	38.9	63.1	102.0	100.9	20.7
1982-83	479.1	467.9	39.9	58.8	98.7	96.3	20.6
1981-82	448.4	441.5	48.2	53.1	101.3	85.0	19.3
1980-81	443.0	445.8	41.2	52.9	94.1	78.2	17.5
1979-80	424.5	444.3	37.4	48.6	86.0	81.0	18.2
1978-79	446.8	430.2	32.5	39.5	72.0	100.9	23.4
1976-77	421.4	385.9	25.9	37.4	63.3	99.8	25.9
1971-72	351.0	344.3	16.3	35.7	52.0	81.0	23.5
1966-67	306.7	279.8	20.3	35.7	56.0	82.1	29.4
1960-61	238.4	234.8	19.6	22.3	41.9	81.8	34.8

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agricultural Circular, Grains*, FG 7-86, July 1986; various other issues. Includes wheat and wheat products.

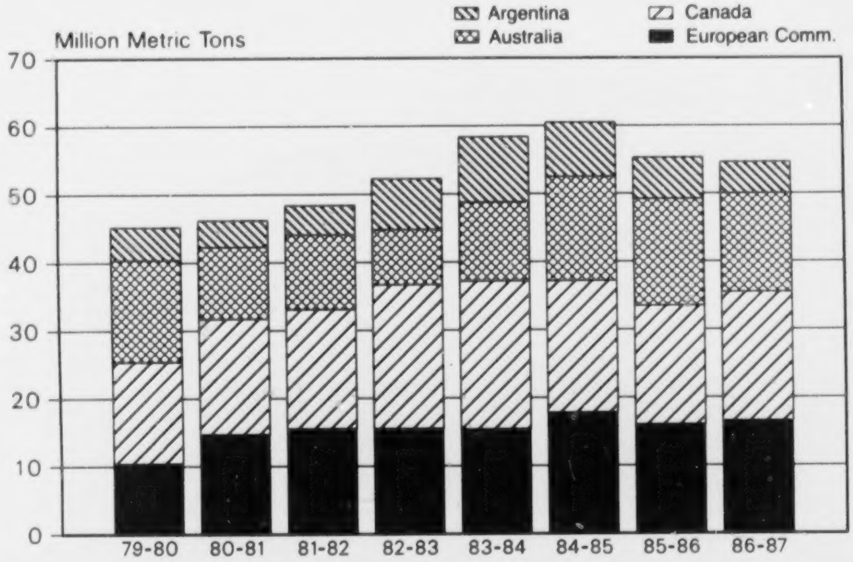
[a] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

and USSR. Larger crops in these nations approximately offset reduced production in China, and Eastern and Western Europe. Record coarse grain output exceeded world utilization by approximately 9 percent and produced the sharpest one-year increase in carryover stocks ever recorded. Global stocks (excluding those in USSR, Eastern Europe, and China, for which no data are available) rose by an unprecedented 66 percent from a year earlier.

As has been the case in most previous years of surplus world production, most of the buildup of stocks occurred in the U.S.[2] In fact, U.S. coarse grain carryover stocks are projected to more than double by fall 1986, rising approximately 67 million metric tons above a year earlier while non-U.S. stocks are projected to decline by about 2 million metric tons. With the U.S. grain sector performing most of the burden of keeping excess world stocks out of the market, the U.S. administration will be under increasing pressure to use newly acquired policy tools to force at least part of these stocks into world markets. These new U.S. tools will be discussed in a later section of this report, which reviews the 1985 Food Security Act passed by the U.S. Congress in December 1985.

World coarse grain consumption remained nearly constant in 1985-86, with a further slowing of the relatively low growth rate that has been present since the late 1970s. Reduced coarse grain utilization is reported to have occurred in USSR, China, Eastern Europe, Argentina, and Canada, with declining utilization in these areas offsetting increased utilization in U.S. corn processing industries, parts of Western Europe, Japan, and several developing nations. The near absence of growth in world coarse grain utilization reflected a leveling off of global livestock numbers and slower growth in global poultry output.

Figure 3. Wheat Exports by Major Non-U.S. Exporters, July-June 1986-87 and Comparisons with Recent Years in Millions of Metric Tons.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 21-83 (Washington, D.C.), July 14, 1983 and FG 5-86 (Washington, D.C.), May 1986.

Table 3. World Coarse Grain Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1986-87 and Selected Recent Years.

July-June Trade Years	Production	Utilization	U.S. Exports[a]	Non-US. Exports	Total Trade[b]	Ending Stocks[c]	Stocks as % of Utilization
Projected							
1986-87	818.2	790.5	46.5	43.7	90.2	199.5	25.2
Preliminary							
1985-86	843.1	775.1	36.1	46.9	83.0	171.8	22.2
1984-85	809.3	780.1	56.6	44.4	101.0	103.7	13.3
1983-84	684.5	759.9	56.6	35.3	91.9	74.5	9.8
1982-83	778.2	751.1	53.0	36.9	89.9	149.8	19.9
1981-82	768.5	738.3	60.0	36.6	96.6	122.7	16.6
1980-81	732.9	745.1	70.7	37.3	108.0	90.6	12.2
1979-80	743.9	743.3	71.0	28.2	99.2	102.6	13.8
1978-79	755.1	746.9	59.5	33.2	92.7	102.1	13.7
1976-77	704.8	686.1	50.1	33.8	83.9	83.4	12.2
1971-72	629.1	615.4	24.2	25.1	49.3	87.0	14.1
1966-67	520.4	519.5	20.0	20.0	40.0	76.1	14.7
1960-61	447.9	437.2	15.7	8.3	24.0	109.7	25.1

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agricultural Circular, Grains*, FG 7-86, July 1986; various other issues.

[a] Based on market years.

[b] From 1976-77 on, the trade year is October-September.

[c] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

In the trade picture, October-September U.S. exports continued the downward trend of the previous five years, with a sharp plunge to the lowest levels since 1974-75. The U.S. trade share in coarse grains also trended sharply downward, with U.S. exports declining by approximately 20.5 million metric tons while the non-U.S. trade share of coarse grain exports continued to rise (see Figure 4). These trends, if continued into 1986-87, also will place strong pressure on the U.S. administration to take policy actions in coarse grains to compete more aggressively with other exporting nations.

A significant part of the decline in U.S. coarse grain exports in 1985-86 likely has been due to the sharp decline in U.S. coarse grain price support levels scheduled to be implemented in the fall of 1986. The effective U.S. price support loan rate for 1986-crop corn (the most important U.S. coarse grain) will decline $.71 per bushel ($27.96 per metric ton) due to combined effects on reduced support levels and balanced-budget legislation. Support levels for other coarse grains will be reduced by similar percentages. Since U.S. prices are a major influence on world price levels, the U.S. support level reduction has signaled competing exporters to move their supplies before the lower U.S. supports become effective. Support level reductions also are signaling to foreign and domestic users to deplete inventories and wait for lower-priced new-crop grain. By the fall of 1986, these supply and demand effects should have run their course, and should set the stage for a modest uptrend in U.S. coarse grain exports.

World Rice Production Down Slightly but Still Large

Global production of rice declined slightly in 1985-86, for the first time in six years. Despite the decline, production was still the second largest on record, 2.3 percent above two years earlier, and slightly above aggregate world consumption (see Table 4). As a result, world rice stocks continued to trend slightly upward both in absolute size and as a percent of annual utilization. Reduced production reflected smaller crops in the U.S., Australia, Brazil, China, and Pakistan, which were nearly offset by increased production in India, Indonesia, and Thailand.

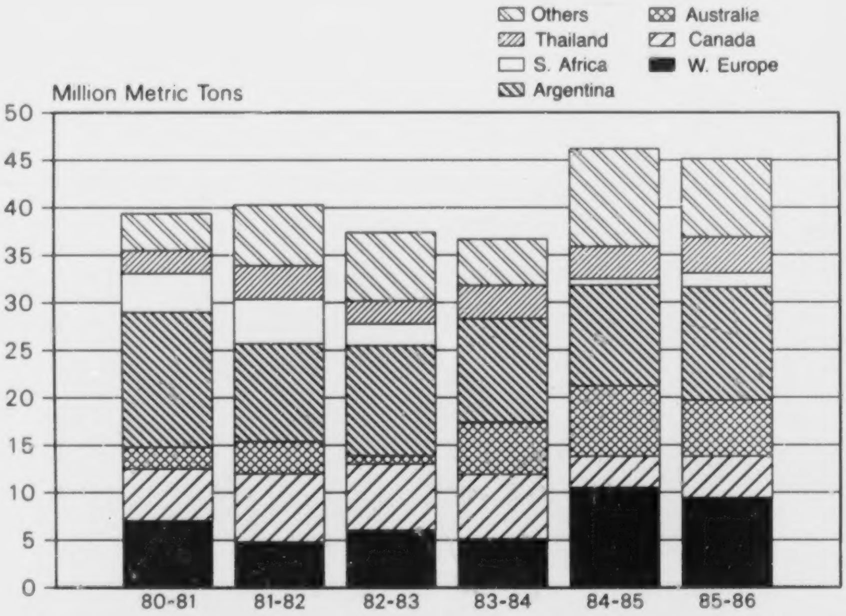
World rice consumption leveled off in 1985-86 after a steady and unbroken upward trend that had been in effect since 1972-73. Stabilized consumption reflects an estimated 6 percent decline in utilization by China, the world's largest rice-consuming nation, along with continued increases in rice utilization by most other major rice-consuming countries.

Reported global rice stocks are projected at a record 24 million metric tons, 11 percent higher than last year. Stocks at this level are equivalent to 7.7 percent of annual utilization, slightly below the 8 to 9 percent level of the late 1960s. However, it should be noted that officially reported stocks exclude those of North Korea, Laos, Vietnam, and China, where official stocks data are not published. These four nations produce approximately 60 percent of the world's rice output. Exclusion of their stocks almost certainly understates world stocks by a substantial margin. About one-third of the projected increase in 1986 global stocks is occurring in the U.S., despite the fact that the U.S. accounts for less than 2 percent of the world rice production.

World rice exports are projected to increase by about 7 percent in the 1985-86 trade year. As with other grains, U.S. rice exports trended downward from previous highs through 1984-85. However, preliminary data indicate U.S. rice exports increased slightly in 1985-86 and may increase again in 1986-87.

The U.S. still retains its position as the world's second largest rice exporter, with Thailand being the largest exporter of that commodity. Other leading rice exporters include the EC, China, Pakistan, and Burma.[3] Rice exports from China and Pakistan are expected to be slightly below last year, but should be more than offset by expected increases of 8, 15, and 11 percent, respectively in exports from Thailand, EC, and Burma. U.S. rice exports are expected to be down 28 percent from the level of four years earlier. Total non-U.S. exports, on the other hand, are expected to be 5 percent higher than in 1982. The shrinking U.S. share of global rice trade is a major factor behind dramatic changes in U.S. price support policies that parallel those of other grains and will be discussed in a later section of this report. U.S. price support programs are being changed to

Figure 4. Coarse Grain Exports by Major Non-U.S. Exporters, October-September 1985-86 and Comparisons with Recent Years in Millions of Metric Tons.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-84 (Washington, D.C.), April 1984 and FG 5-86 (Washington, D.C.), May 1986.

permit sharply lower cash prices that will compete more effectively with foreign exporters. At the same time, incomes of U.S. producers are being supported by increased direct government payments. These policy changes seem likely to halt the decline in the U.S. share of world rice trade over the next few years.

Among major importers, Brazil is projected to double its rice imports in 1986 because of adverse weather and reduced production. Increases of 9, 16, 25, and 25 percent, respectively, are projected for EC, Iraq, Iran, and Vietnam. Increases in imports by these nations are partially offset by an anticipated 69 percent decline in Philippines rice imports and relatively steady imports by other rice importing nations.

For the longer term, world rice production and consumption appear likely to continue their nearly steady upward trend. Increased consumption will be generated by relatively rapid population growth rates in many major rice consuming nations. Technological developments and increased application of currently available technology appear likely to maintain the upward trend of global production for the next several years, in the absence of major adverse weather problems in key rice-growing areas. Prospects for growth in world trade in rice are less certain and may be restrained some by increased production in importing nations.

World Oilseed Production, Exports, Stocks Continue Upward Trend[4]

Preliminary estimates indicate aggregate world production of eight major oilseeds rose to a record 192.8 million metric tons in 1985-86. That reflects an increase of 1.5 percent from a year earlier and a 14 percent increase from four years earlier. Production of soybeans, peanuts (or groundnuts), sunflowerseed, rapeseed, flaxseed, copra, and palm kernel all increased significantly from the previous year, partly as a result of favorable weather in several major producing regions. The increase in soybean production was concentrated largely in the U.S. and Argentina, where increases of 13 and 12 percent, respectively, more than offset an estimated 25 percent decline from the previous year in Brazilian production. The sharply reduced Brazilian crop was due to severe drought at planting time and the early part of the growing season, along with excessive rains at harvest time. In contrast to other oilseeds, world cottonseed production declined by approximately 11 percent. The smaller cottonseed crop was due mainly to reduced area harvested and lower yields in China and Brazil because of adverse weather in those two countries. The world's leading cotton and cottonseed producers in order of size continue to be China, USSR, U.S., India, Pakistan, and Brazil. Sunflowerseed production rose modestly above the previous year as a result of increased production in the USSR and EC. Rapeseed production expanded substantially in China and EC as a result of increased area planted. Palm kernel and copra production increased substantially in response to favorable weather in Malaysia and the Philippines, which are major producers of these products.

Global exports of major oilseeds, according to preliminary projections by the U.S. Department of Agriculture, have turned upward in 1985-86 after a 3 year downtrend.[5] Preliminary data in Table 5 indicate aggregate exports will be 5 percent higher than in 1984-85 as a result of increased Soviet imports, slightly improved meal demand in Europe and the Far East, and prices that are more competitive with other feed ingredients, as a result of the sharp decline in the exchange rate of the U.S. dollar. Global carryover stocks of major oilseeds at the end of the 1985-86 trade year are projected to be one-fourth to one-fifth larger than a year earlier. Stocks at that level in absolute terms would be the highest on record, and would represent about 16 percent of total annual utilization. Most of the increase in oilseed stocks is expected to be in soybeans, with larger stocks of that commodity concentrated primarily in the U.S. Unlike grains, U.S. soybean exports are rising in 1985-86, while aggregate non-U.S. exports are declining this season. The decline in non-U.S. exports is due largely to the large decrease in Brazil's March-May 1986 soybean harvest.

Table 4. World Milled Rice Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1986-87 and Selected Recent Years.

July-June Trade Years	Production	Utilization	U.S. Exports[a]	Non-U.S. Exports[a]	Total Trade[a]	Ending Stocks[b]	Stocks as % of Utilization
Projected							
1986-87	320.6	321.4	2.6	9.3	11.9	23.3	7.2
Preliminary							
1985-86	316.3	314.0	2.2	10.1	12.3	24.0	7.7
1984-85	318.3	313.8	1.9	9.6	11.5	21.7	6.9
1983-84	308.0	308.1	2.1	10.5	12.6	17.2	5.6
1982-83	285.7	289.6	2.3	9.6	11.9	17.3	6.0
1981-82	280.6	281.5	2.7	9.1	11.8	21.3	7.6
1980-81	271.0	272.3	3.0	10.1	13.1	22.1	8.1
1979-80	258.1	262.6	2.7	10.0	12.7	23.4	8.9
1978-79	263.7	258.6	2.4	9.6	12.0	27.9	10.8
1976-77	236.9	238.4	2.1	8.5	10.6	17.8	7.4
1971-72	216.4	218.8	1.8	6.9	8.7	15.4	7.0
1966-67	179.3	180.7	1.7	6.1	7.8	10.6	5.9
1961-62	147.3	147.7	0.9	5.4	6.3	7.0	4.8

Source: U.S. Department of Agriculture, Foreign Agriculture Service, *Foreign Agricultural Circular, Grains*, (Washington, D.C.), FG 7-86, July 1986.

[a] Exports are computed on a calendar year basis.

[b] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

In 1985-86, production of major vegetable and marine oils has increased by a slightly larger percentage than protein meal production (see Tables 5 and 6). Larger increases in oil production reflect the relatively strong growth rates in production of high oil content oilseeds such as palm kernel, coconut, sunflowerseed, and rapeseed and a smaller percentage increase in soybean production, which has a relatively low oil content and higher meal-yield per ton.[6] Increased oil production coupled with slow growth in world demand has brought a sharp increase in U.S. and world vegetable oil stocks. That, in turn, has pushed soybean oil and other vegetable oil prices (in current U.S. dollars) at times in 1985-86 to the lowest level in a decade.

In contrast, ending world protein meal stocks in 1985-86 are expected to be slightly below year earlier levels. Declining stocks have caused processors to crush oilseeds more for meal than for oil, with meal providing a larger share of the value of oilseeds than last season. With a relatively tighter supply situation in meal than in oil, 1985-86 meal prices have been modestly

Table 5. World Oilseed Production, Crush, Trade, and Carryover Stocks in Millions of Metric Tons in 1985-86 and Selected Recent Years.

July-June Trade Years	Production	Crush	U.S. Exports	Non-U.S. Exports	Total Trade	Ending Stocks	Stocks as % of Crush
Projected							
1985-86	192.74	152.53	16.07	18.70	34.77	24.94	16.35
Preliminary							
1984-85	190.16	150.41	17.72	15.11	32.83	20.58	13.68
1983-84	165.01	136.74	21.64	11.34	32.98	15.77	11.53
1982-83	178.00	143.51	26.32	8.70	35.02	20.49	14.28
1981-82	169.35	138.33	21.57	14.27	35.84	18.89	13.66
1980-81	155.52	132.61	21.57	10.56	32.13	20.48	15.44
1979-80	170.15	133.77	26.21	9.80	36.01	19.33	14.45

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-86, May 1986, FOP 4-85, April 1985; and FOP 5-84, May 1984.

Table 6. World, U.S., and Foreign Production of Oilseed Products in 1972-73, 1979-80, 1982-83, 1983-84, and 1985-86 in Millions of Metric Tons.

	44% Protein Meal Equivalent						Fat and Oil Production[a]					
	1972-73	1979-80	1982-83	1984-85	1985-86	% Change 1972-86	1972-73	1979-80	1982-83	1984-85	1985-86	% Change 1972-86
U.S.	17.8	27.3	26.6	24.7	25.1	+41.0	7.8	10.4	10.3	10.0	10.0	+28.2
Non-U.S.	35.6	58.8	67.7	72.6	74.0	+107.9	30.6	41.6	44.3	47.5	50.2	+64.1
World Total	53.4	86.1	94.3	97.3	99.1	+85.6	38.4	52.0	54.6	57.5	60.2	+56.8

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Oil Seeds and Products*, FOP 5-86, May 1986; FOP 25-77, December 1977; and personal communication with officials of U.S. Department of Agriculture.

[a] Excluding linseed oil.

Table 7. Wheat and Coarse Grain Area Harvested in Millions of Hectares in Major Producing Countries, 1985-86 and Comparisons with Recent Years.

	Coarse Grains							Wheat						
Area or Country	1970-71	1975-76	1981-82	1982-83	1983-84	Prelim. 1984-85	Proj. 1985-86	1970-71	1975-76	1981-82	1982-83	1983-84	Prelim. 1984-85	Proj. 1985-86
W. Europe	24.0	25.2	24.4	24.1	23.3	23.4	23.8	17.0	15.4	16.4	16.9	17.0	17.1	16.2
Canada	8.4	8.6	9.2	8.9	7.8	8.0	8.2	5.1	9.1	12.4	12.6	13.7	13.2	13.7
Australia	4.3	3.9	4.8	4.5	5.8	5.4	5.6	6.5[a]	8.6[a]	11.9[a]	11.5	12.9	12.0	12.0
Argentina	7,5	5.9	6.4	6.3	6.2	6.1	5.7	3.7	5.3	5.9	7.3	6.9	6.0	5.3
S. Africa	5.5	5.6	5.3	4.8	4.8	4.8	4.9	1.9[a]	1.8[a]	1.8[a]	2.0	1.8	1.9	1.9
U.S.S.R.	43.9	58.1	58.0	58.0	61.2	59.2	58.5	65.2	62.0	59.2	57.3	50.8	51.1	50.3
Total above	93.6	107.3	108.1	106.6	109.1	106.9	106.7	99.4	102.2	107.6	107.6	103.1	101.3	99.4
U.S.	39.7	42.6	43.6	43.6	32.9	43.6	45.4	17.7	28.1	32.8	32.0	24.8	27.1	26.2
Total	133.3	149.9	151.7	150.2	142.0	150.5	152.1	117.1	130.3	140.4	139.6	127.9	128.4	125.6

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 10-74, April 1974; FG 13-82, April 26, 1982; FG 16-75, December 22, 1975; FG 7-77, July 1977; and *World Crop Production*, WCP 4-85, April 11, 1985; WCP 4-86, April 1986; and personal communication with officials of U.S. Department of Agriculture, Foreign Agricultural Service.

[a] Planted area.

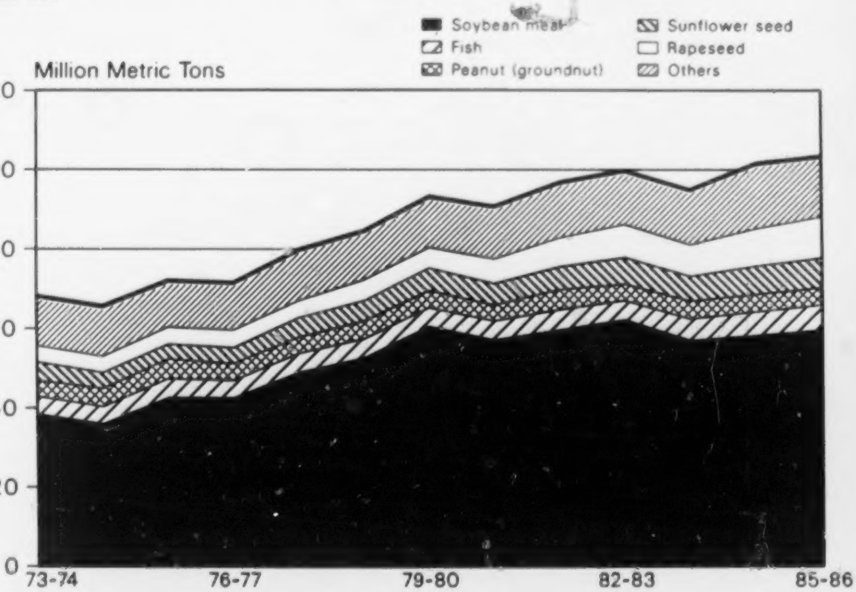
above the previous year but generally below levels of the mid to late 1970s. Meal demand continues to be restrained some by extensive wheat feeding in many areas. Wheat has a higher protein content than corn, thus reducing the need for supplemental protein meal when it is used to replace corn in livestock and poultry rations. Early indications point to continued plentiful world vegetable oil supplies in the year ahead, with protein meal remaining in slightly tighter supply than oil through at least April 1987. Meal supplies after April 1987 will depend heavily on new-crop soybean production in Brazil and Argentina. Favorable weather in these two countries could lead to some easing of tightness in meal supplies from late April 1987 onward.

As Figure 5 indicates, much of the long-term growth in world protein meal production has come from soybean meal. That pattern appears likely to continue in the year ahead and over the next several years, with an upward trend in soybean production in South America and the U.S. However, with large world wheat production and potentially higher yields through expanded use of hybrid varieties, wheat feeding may remain relatively high in the next few years. That may lead to slightly slower growth in the world demand for soybean meal than in the 1970s.

Figure 6 indicates soybean oil has faced much greater competition from other products in world markets than has been the case with soybean meal. Soybean oil production continues to be larger than that of any other individual vegetable, marine, or animal fat or oil. But combined production of all other fats and oils is nearly four times as large as soybean oil. In the years immediately ahead, soybean meal will likely remain as the dominant source of protein meal for livestock and poultry feeding. However, expanded palm tree plantings in Malaysia and interest in similar plantings in other tropical nations suggest that a significant part of the growth in world demand for vegetable oils will be supplied by palm oil during the next 5 to 10 years.[7]

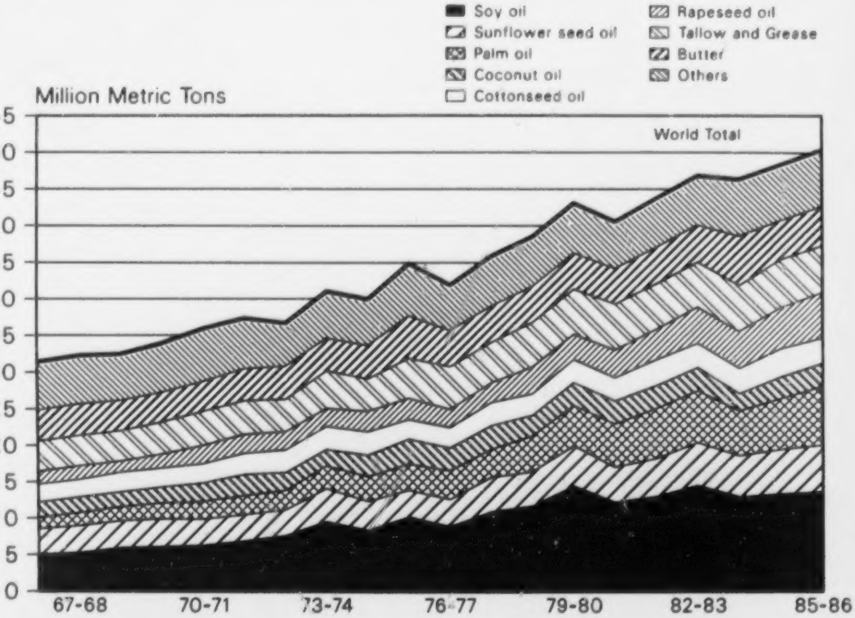
Figures 7 through 9 show the trend in major geographical origins of soybean, soybean meal, and soybean oil exports. Non-U.S. soybean exports have trended moderately upward since the early 1970s, primarily originating from Brazil and Argentina. However, U.S. exports of unprocessed soybeans continue to be much larger than either of these two nations and have shown a long-term upward trend.

Figure 5. World Protein Meal Production by Type of Product, 1973-74 through 1985-86.



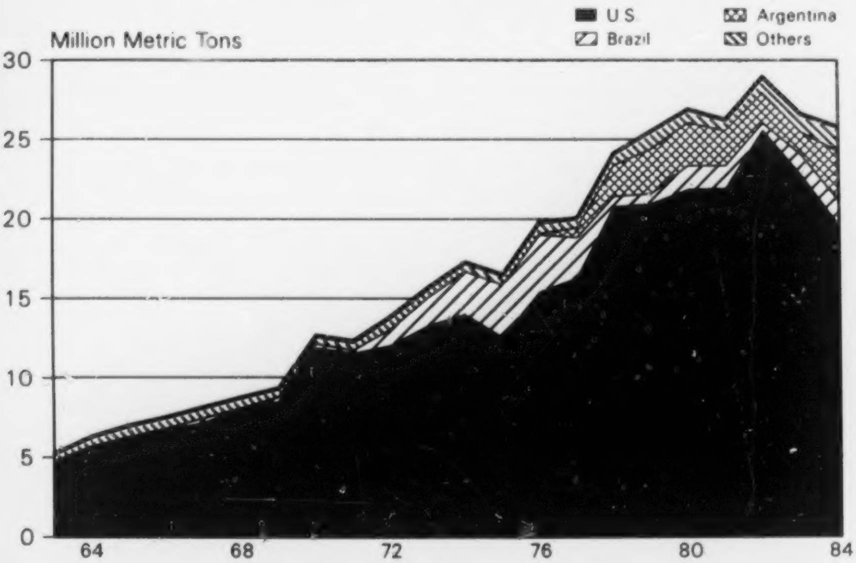
Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-86 (Washington, D.C.), May 1986 and personal communications with officials of U.S. Department of Agriculture *Foreign Agriculture Circular*.

Figure 6. World Fat and Oil Production by Type of Product, 1966-67 through 1985-86.



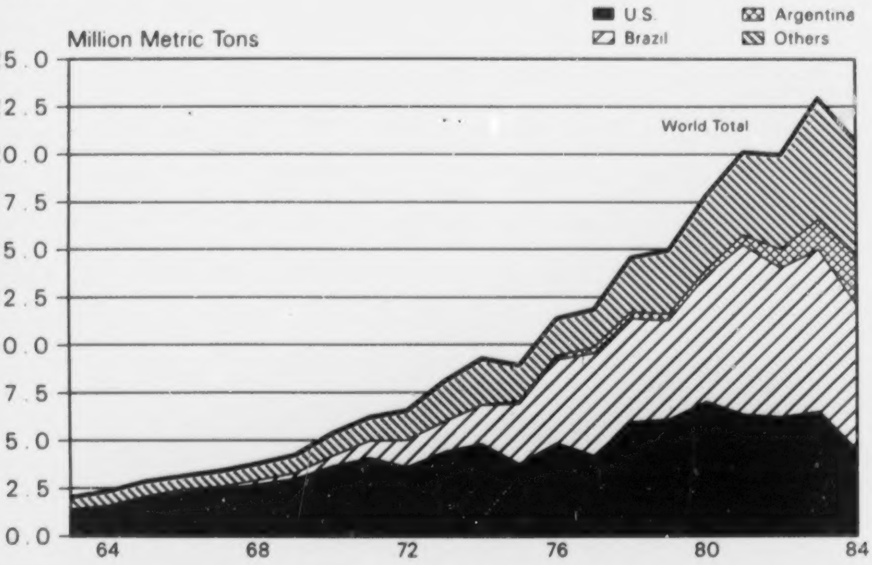
Source: U.S. Department of Agriculture, Foreign Agricultural Service, Foreign Agriculture Circular, Oilseeds and Products, FOP 5-86 (Washington, D.C.), May 1986 and various other issues.

Figure 7. World Soybean Exports by Country of Origin, Calendar Years 1963-84.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

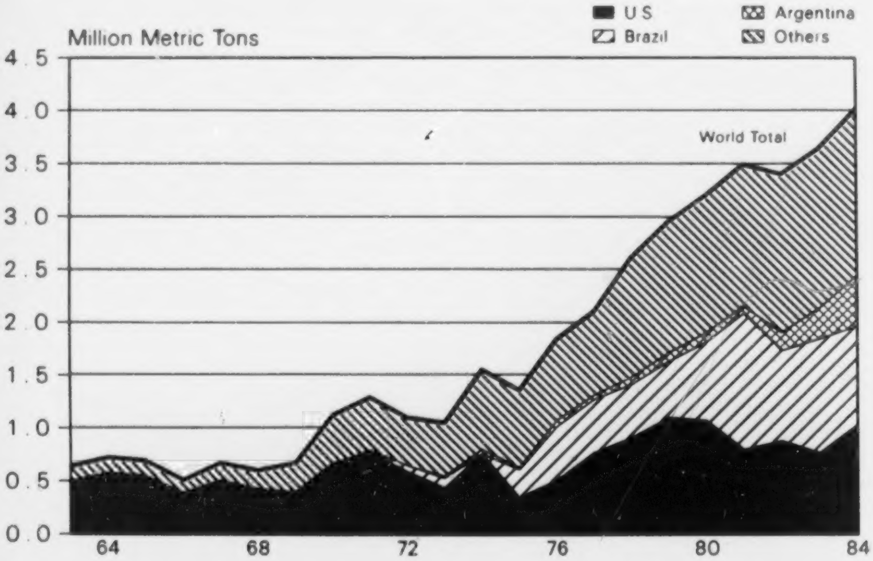
Figure 8. World Soybean Cake Exports by Country of Origin, Calendar Years 1963-84.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

World soybean meal and oil exports, in contrast, show relatively steady U.S. exports, and sharply expanded exports by Brazil, Argentina, and other nations. The "Other" categories in Figures 8 and 9 consist mainly of the EC, Spain, and Portugal where U.S. and South American soybeans are processed and a portion of the resulting meal and oil production is re-exported. This pattern indicates the U.S. soybean processing industry has been largely denied participation in the growth in world demand for its value-added exports. Growth of foreign soybean processing capacity has been encouraged partly by differential export or import taxes on products versus unprocessed soybeans.[8] Barring major changes in trade policies, the U.S. soybean processing industry is likely to face continued strong competition from non-U.S. processors in the years ahead.

Figure 9. World Soybean Oil Exports by Country of Origin, Calendar Years 1963-84.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Long-Term Trend in World Grain Area and Yields

World harvested grain area has trended slowly upward during the last several decades through more extensive cropping practices and shifts from pasture to grain, drainage of wet areas, land clearing in parts of the U.S. and South America, and increased use of irrigation to convert arid or semi-arid areas to crop production. Year-to-year changes in the world's cropland base resulting from such adjustments are relatively small. However, over a one or two-decade time span the impact can be sizable and has contributed to the long-term upward trend in global food production. The long-term trend toward increased grain area being harvested continued in 1985-86, although the upward trend may slow in future years because of more aggressive U.S. use of short and long-term land idling programs, and reduced economic incentives for land clearing in Brazil.[9]

Coarse Grain Area Up, Wheat Down

Figure 10 and Table 7 indicate world coarse grain area harvested increased slightly in 1985-86, with increases in the U.S., Canada, Thailand, and South Africa. Global area harvested was 1 percent above a year earlier and 7 percent above two decades earlier but 2 percent below the 1975-76 level. In contrast to coarse grains, world wheat area harvested in 1985-86 dropped 0.7 percent below a year earlier, but was up 2 and 6 percent respectively from one and two decades earlier. Wheat area in the U.S. declined slightly in 1985-86, along with decreases in USSR, Argentina, Eastern Europe, and EC. Wheat area expanded slightly in Canada and remained constant in Australia in 1985-86. World rice area also declined slightly in 1985-86 but remained slightly above the level of 10 years earlier. Total world grain area harvested reached a record high in 1981-82, and has declined modestly since that time with reductions in area devoted to each of the three major categories of grain: wheat, rice, and coarse grains. Less than one-fifth of the decline in global harvested grain acreage since 1981-82 can be accounted for by U.S. land idling programs.

Europe, Canada, Australia Expand Wheat Area

The U.S. Payment-in-Kind program reduced U.S. wheat area harvested in 1983-84 by 23 percent as farmers received government grain in return for reducing their plantings and were allowed to graze or harvest previously planted wheat as hay. However, three regions—Canada, Australia, and Western Europe—expanded their wheat areas that year and continued planting at or near the higher level in 1984-85 and 1985-86. Thus, the U.S. PIK program for wheat was partially offset as non-U.S. producers sought to take advantage of an expected tightening of world supplies. While U.S. wheat area fell nearly by one-fourth as a result of the PIK program, total area of major wheat growing nations declined by only 8 percent. Unlike coarse grain, the U.S. PIK program remained in effect in 1984-85 and 1985-86 because of continuing large U.S. and world wheat supplies. Slightly less area was idled under the program than in 1983-84, so that 1985-86 U.S. and world wheat area rose slightly above that of 1983-84.

Longer-term trends indicate total 1985-86 wheat area harvested in major producing nations was 11 percent above a decade and a half earlier but down 4 percent from peak 1981-82 level. Wheat area harvested in the U.S. was 48 percent larger than 15 years earlier, while the harvested area of major non-U.S. wheat producers increased only 7 percent during the same period. Non-U.S. area in 1984-85, however, would have been much further above 1970-71 levels except for a 14 million hectare decline in estimated Soviet wheat area. Non-U.S. wheat producing nations that sharply expanded harvested area in the 1970s and early 1980s included Canada, Argentina, and Australia.

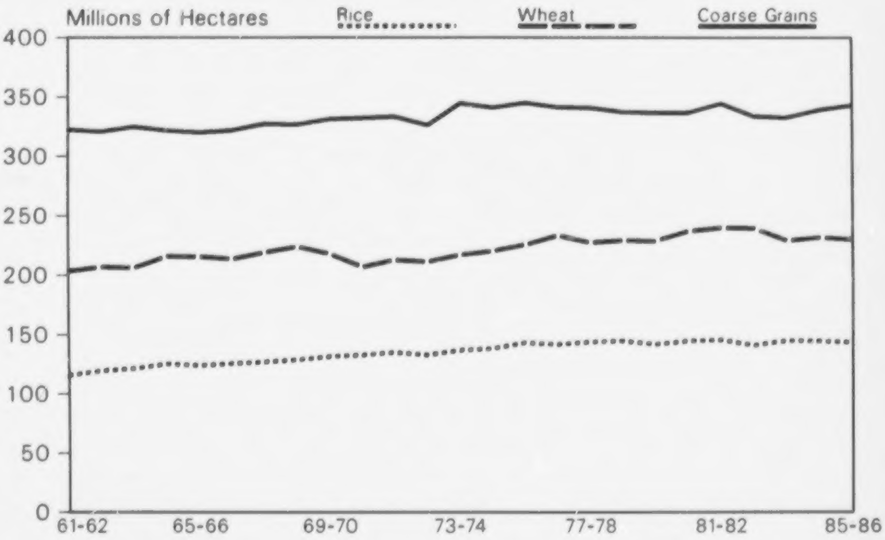
Rice Area Continues Long-Term Upward Trend

World rice area harvested declined slightly in 1985-86, dropping slightly below the long-term upward trend (see Figure 10). Preliminary estimates place global area 0.1 percent less than the record 1981-82 level but 8 percent above a decade and a half ago. U.S. rice area increased sharply in 1984-85 due to changes in farm programs, but declined slightly in 1985-86 and is expected to be reduced again in 1986-87 because of government incentives to reduce plantings.

Longer-Term Prospects

World grain area harvested may trend slowly upward in the decade ahead with a continuation of long-term trends in land utilization. The greatest potential for expanded plantings appears to be in South America, where additional Argentine pastureland may be converted to grain production and Brazilian land clearing operations are likely to continue. With favorable economic conditions, some additional land

Figure 10. World Harvested Area Devoted to Individual Grains in Millions of Hectares, 1961-62 through 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 5-86 (Washington, D.C.), May 1986.

also could be cleared and drained for crop production in the U.S. However, such land is unlikely to be brought into crop production in significant quantities until profit margins in crop production increase from recent depressed levels. The Soviet Union also has some additional land that could be brought into crop production through irrigation or drainage. Whether or not such land is utilized will depend on the priority placed on agriculture by the new Soviet leadership, and the cost and availability of imported grain.

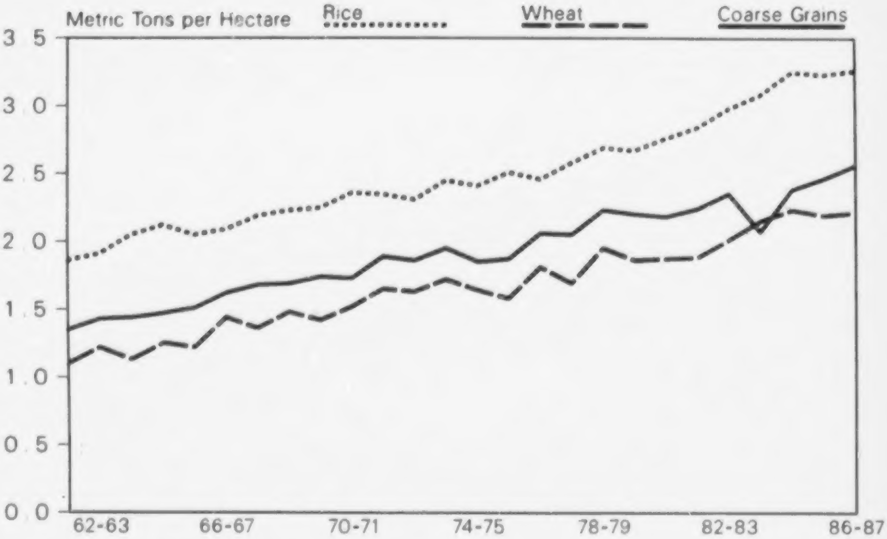
Trends in Global Grain Yields

In the past two and one-half decades as shown in Figure 11, world grain yields per hectare have shown an irregular long-term upward trend. During this period, global rice yields have increased approximately 62 percent along with an 85 percent increase for wheat and a 70 percent increase for coarse grains. Drought in the U.S. and South Africa was largely responsible for the sharp decrease in the world average coarse grain yields in 1983-84, along with moderate yield reductions in parts of Europe. In 1984-85 and 1985-86, the global average coarse grain yield resumed its upward trend with favorable weather in many areas.

Wheat and rice yields have been increasing at a slightly accelerated rate in recent years with the spread of higher-yielding hybrid varieties, increased use of fertilizer, expanded use of irrigation in some areas, and other technological innovations. With favorable weather, a continued upward trend in global average yields appears likely during the next several years. The upward trend appears likely to be generated by increased applications of existing yield-improving technology as well as by an ongoing gradual development of improved varieties, better management, improved cultural practices, and other technological developments.

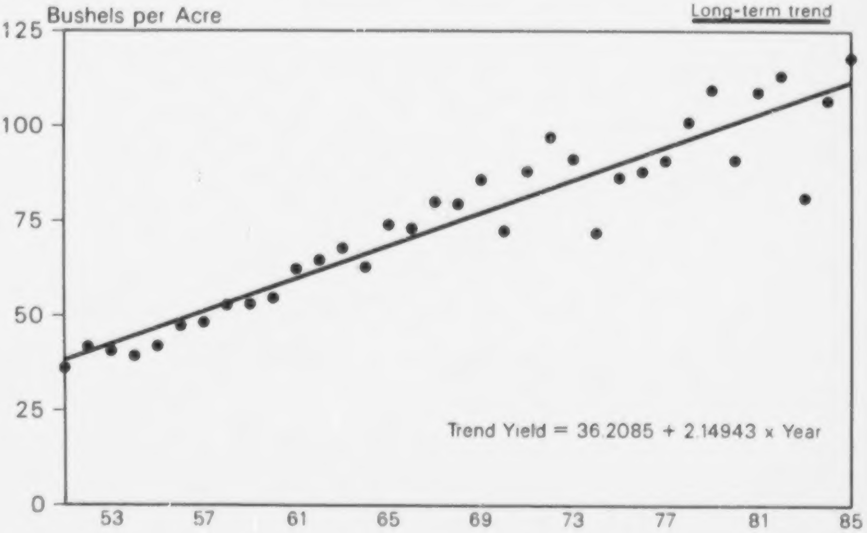
Figure 12 shows the long-term upward trend in U.S. corn (maize) yields from 1950 through 1985. During this period, yields have increased at an average rate of slightly over two bushels per acre (.13 metric tons per hectare) per year, and the upward trend appears to continuing in the mid-1980s.[10] Figure 12, however, does show an increased year-to-year variability of U.S. corn yields in the 1970s and 1980s when compared with the previous two decades. Greater variability of yields in recent years is believed to be due to increased year-to-year fluctuations in temperatures and rainfall in the U.S. cornbelt, rather than to characteristics of current corn production technology.

Figure 11. World Grain Yields in Metric Tons per Hectare, 1961-62 through 1986-87.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 5-86 (Washington, D.C.), May 1986.

Figure 12. U.S. Corn Yields in Bushels per Acre, 1950-85.



Source: U.S. Department of Agriculture, Statistical Reporting Service, Crop Reporting Board, *Crop Production 1985 Summary* crpr 2-1 (86), (Washington, D.C.), January 1986; *Field Crops* Statistical Bulletin No. 708, and various other issues.

Table 8. Comparative Yields in Metric Tons per Hectare of Selected Grain Producing Countries.

	Coarse Grains						Wheat					
Area	1979-80	1981-82	1982-83	1983-84	Prelim. 1984-85	Proj. 1985-86	1979-80	1981-82	1982-83	1983-84	Prelim. 1984-85	Proj. 1985-86
U.S.	5.71	5.71	5.80	4.17	5.46	6.04	2.30	2.32	2.39	2.65	2.61	2.52
Canada	2.63	2.83	3.00	2.68	2.73	2.98	1.64	2.00	2.13	1.94	1.61	1.75
Argentina	2.20	2.88	2.86	2.82	3.02	3.24	1.69	1.41	2.05	1.85	2.22	1.61
Brazil	1.73	1.71	1.74	1.65	1.82	1.58	0.75	1.15	0.65	1.11	1.09	1.46
Australia	1.47	1.37	0.87	1.63	1.59	1.50	1.45	1.38	0.77	1.70	1.52	1.38
World	2.17	2.20	2.34	2.05	2.39	2.46	1.85	1.87	2.01	2.14	2.23	2.20

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, World Crop Production*, WCP 4-82, April 12, 1982; WCP 3-84, March 9, 1984; WCP 4-85, April 11, 1985; WCP 4-86, April 1986; *Foreign Agriculture Circular, Oil Seeds and Products*, FOP 5-83, May 1983, and personal communication with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

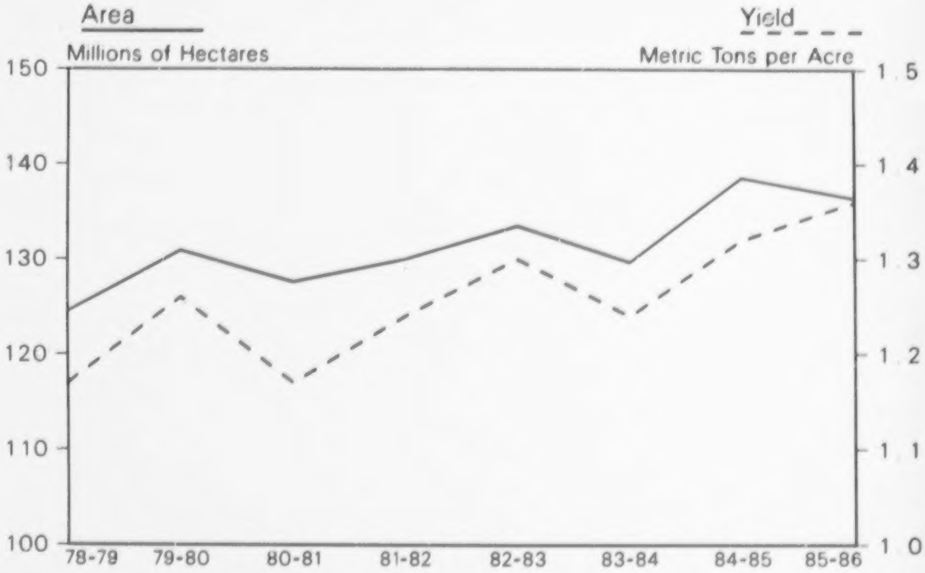
Trends in Global Oilseed Area and Yields

After increasing slightly in 1984-85, global oilseed harvested area registered a small decline in 1985-86. The decline reflected reduced soybean acreage in the U.S., China, and Brazil as well as reduced cottonseed plantings in China. Brazilian soybean area was restricted by widespread drought at planting time, while the decline in U.S. soybean plantings reflected more attractive returns from production of alternative crops. Total soybean area harvested in the six leading soybean producing nations dropped 4 percent below the previous year but remained 26 percent above a decade earlier, as shown in Table 9. Aggregate world area harvested and the average yield per hectare of all oilseeds are shown in Figure 13, with area devoted to individual crops shown in Figure 14. Harvested area and yields both have exhibited a long-term upward trend but with downward deviations from that trend at intervals of one to two years. The year 1985-86 represents a downward deviation in area harvested but an upward deviation in average yield. The increase in yields in 1985-86 reflected generally favorable weather in most major oilseed areas during the growing season, with exceptions being the Brazilian soybean-cotton belt and China's cotton-growing area.

The long-term upward trend in global oilseed area reflects land clearing in Brazil, conversion of pasture land to soybeans in Argentina, shifts from small grains and pasture to soybeans in the U.S., increased rapeseed plantings in Canada, EC, China, and India, and increased sunflowerseed plantings in Argentina. With the exception of the U.S., these trends appear likely to continue in most other areas in the next few years as a result of depressed world prices for wheat and coarse grains, and policy actions by EC and India to encourage increased self-sufficiency in oilseed production. Growth of U.S. soybean plantings will be restrained somewhat by a long-term government conservation reserve program designed to idle highly erodible farmland for up to 10 years.

Average world oilseed yields have been in a gradual long-term upward trend for the past several years, as shown in Figures 13, 15 and 16 and Table 9. That trend appears likely to continue in the years ahead but will be interrupted periodically by unfavorable weather in major growing regions. The upward trend reflects higher yielding varieties, improved production management, the gradual dispersion of currently available technology for weed and disease control, and improved harvesting practices to reduce field losses and quality deterioration.

Figure 13. World Yields in Metric Tons per Hectare, and Harvested Area Devoted to Major Oilseeds, 1978-79 through 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-86 (Washington, D.C.), May 1986.

Table 9. Soybean Area Harvested in Millions of Hectares in Major Producing Countries, 1985-86 and Comparisons with Recent Years.

Area	1970-71	1975-76	1978-79	1981-82	1982-83	1983-84	Prelim. 1984-85	Proj. 1985-86	Percent Change from 1970-71 to 1985-86
U.S.	16.7	20.8	23.4	26.9	28.3	25.3	26.8	24.9	+ 49
Brazil	1.3	5.8	7.8	8.3	8.2	9.3	10.0	8.9	+ 585
Argentina	.03	0.4	1.3	2.0	2.1	2.9	3.3	3.4	+11,233
China	8.0	8.8	6.8	8.0	8.4	7.6	7.3	7.8	− 3
Canada	0.1	0.2	0.2	0.4	0.4	0.4	0.4	0.4	+ 300
Paraguay	0.4	0.2	0.3	0.4	0.4	0.4	0.6	0.6	+ 50
Total	26.17	36.2	39.8	46.0	48.2	45.9	48.4	46.0	+ 76

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, World Crop Production*, WCP 6-82, May 10, 1982; WCP 4-85, April 11, 1985; WCP 5-86, May 12, 1986; *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-83, April 1983; FOP 4-84, April 1984; and personal communication with officials of U.S. Department of Agriculunication with officials of U.S. Department of Agriculture, Foreign Agricultural Service.

Future Trends in World Soybean Production

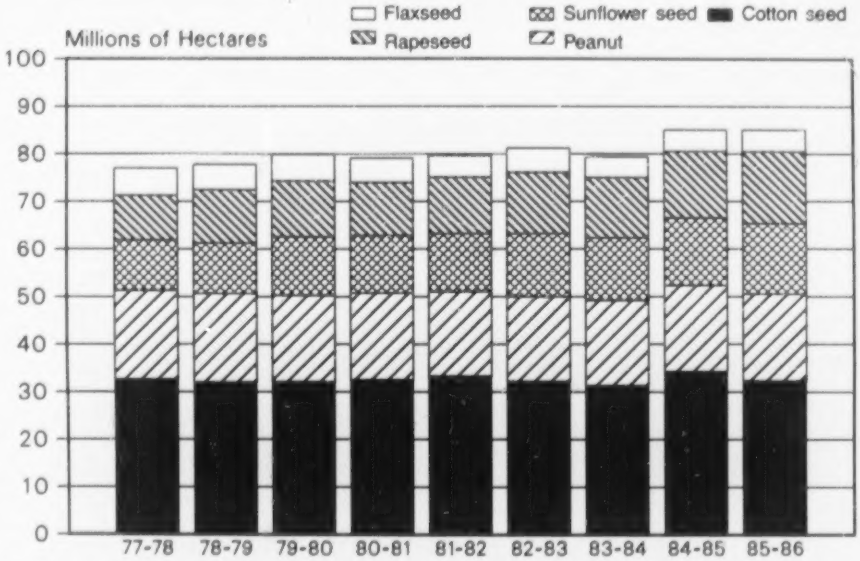
Trends in world soybean plantings in the next few years will be influenced considerably by the growth in world demand for protein meal. With indications of a strong long-term upward trend in production of high oil content oilseeds such as palm products," soybeans' comparative advantage will be in the protein sector. Unlike most other oilseeds, soybeans have a relatively low oil content and high protein meal yield per ton. Long-term growth in protein meal demand will depend on several key variables including global economic growth rates, the strength of the U.S. dollar, adjustments of developing nations to debt problems, and the trend in protein contents of livestock and poultry rations in the Soviet Union. Present indications are that world economic growth will trend modestly upward, the U.S. dollar will remain below previous highs for the next few years, and increased priority will be placed on the use of protein meal in Soviet meat and poultry production. These trends should bring a gradual improvement in soybean prices relative to those of grains, and should generate a slight long-term upward trend in soybean plantings in the U.S. along with a moderate upward trend in South America.

Figure 16 and Table 10 show the long-term upward trend in U.S. soybean yields. In the last three and one-half decades, yields in the U.S. have shown an average yearly increase of 0.31 bushels per acre (0.02 metric tons per hectare). This trend appears likely to continue during the next several years as currently available technology and management practices are applied to a larger portion of the planted area. Included in this category are row spacings, pest, disease and weed control, timing of field operations, fertilization programs, tillage practices, and harvesting procedures to minimize field losses. Similar trends appear likely in application of technology, management practices and yields in South America in the next few years, given favorable weather during the planting and growing season.

World Livestock and Poultry Meat Production Trends

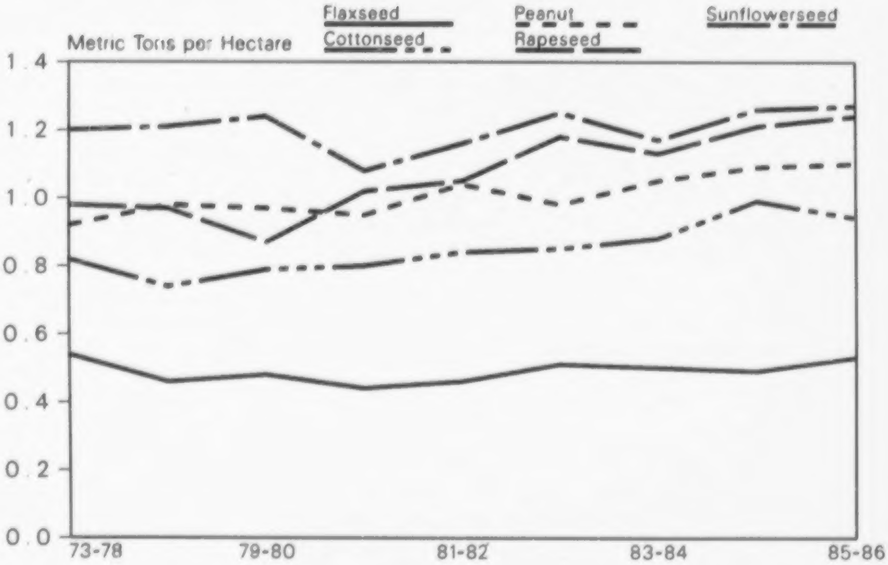
World meat production since the mid-1950s has been sensitive to trends in consumer incomes of rapidly developing and industrialized nations, and has been an important influence on demand for coarse grains,

Figure 14. World Area Harvested in Millions of Hectares of Selected Oilseeds, 1972-77 Average and 1977-78 through 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-86 (Washington, D.C.), May 1986 and various other issues.

Figure 15. World Yields in Metric Tons per Hectare of Selected Oilseeds, 1973-78 Average and 1977-78 through 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-86 (Washington, D.C.), May 1986 and various other issues.

protein meal, and other feed ingredients. Rising consumer incomes have tended to bring increased production and consumption of red meat and poultry. This trend was especially evident in rapidly developing nations in the 1960s and 1970s, but has been followed by much slower growth in global meat production in the 1980s. The recent slower growth rate reflects sluggish world economic growth, as well as health concerns and changing dietary trends in the U.S. and possibly other areas. Slower expansion of meat production, in turn, has been partly responsible for less rapid expansion in consumption of coarse grains and protein meal, and resulting downward pressure on prices of these commodities.

Beef Production Down, Pork Up

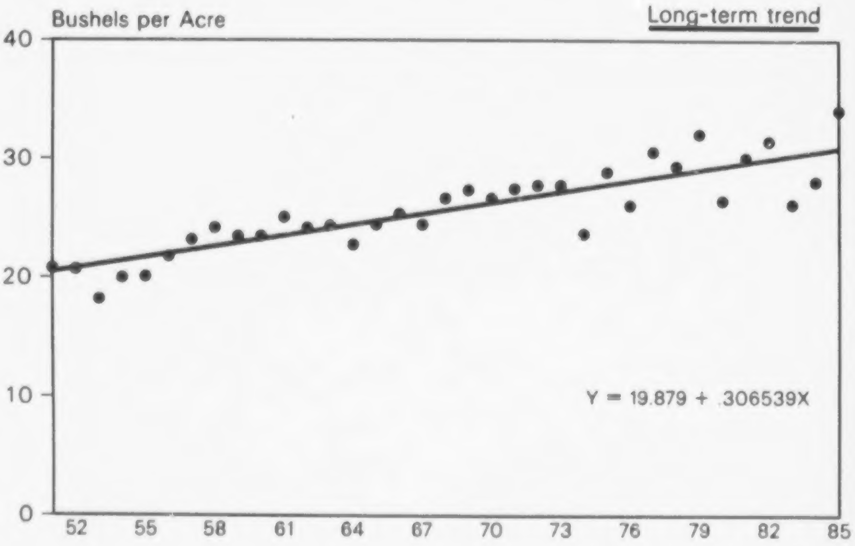
Table 11 shows pork production trends in major producing countries during the last decade. Preliminary projections place 1986 world production 1.3 percent higher than last year and one-third larger than the 1974-78 average. With world population expanding at about 2 percent per year, per capita production is declining slightly in 1986 but will be moderately above the level of a decade earlier. Pork production is expected to decline slightly in 1986 in the U.S., Canada, East Germany, and Japan, but will likely be above the previous year in the EC, USSR, and China. In contrast to relatively stable North and South American pork production in the last decade, pork production has shown a strong long-term upward trend in the EC, other West European nations, USSR, China, and other Asian nations. After a substantial reduction in East European pork production in the early 1980s in response to severe debt and financial problems, that area's production rose modestly from 1983 to 1985. However, preliminary projections indicate the expansion has come to a temporary halt in 1986.

In contrast to pork, world beef production is expected to decline modestly in 1986, with the sharpest reductions occurring in North America and the EC (see Table 12). Global production is projected to decline 1.7 percent from 1985. Production at the projected level would be only 3.3 percent above the 1974-78 average, and would leave per capita consumption 15 to 18 percent below a decade earlier. Australia, New Zealand, and USSR deviated slightly from 1986 trends in other major beef-producing countries. Production is expected to be approximately constant in USSR in 1986, along with increases of 1.1 and 0.8 percent respectively for the other two nations.

Continued Upward Trend in Global Poultry Production

In response to growing consumer incomes, consumer desire for more variety in diets, and a wider range of poultry meat products being made available by processors, global poultry meat production and consumption have increased every year since 1979 (see Table 13). This steady long-term upward trend is expected to continue in 1986, with world production projected to rise 2.9 percent above the previous year. At that level, world production will be about 60 percent above the 1974-78 average and per capita production will be up approximately 40 percent from the same time period. Increased production is expected in nearly all major producing areas except Mexico and Eastern Europe. In these two areas, production growth has been restricted by severe debt burdens, limited availability of capital to expand output, and slow economic growth.

Figure 16. U.S. Soybean Yields in Bushels per Acre, 1950-85.



Source: U.S. Department of Agriculture, Statistical Reporting Service, Crop Reporting Service, Crop Reporting Board, *Crop Production, 1985 Summary*, crpr 2-1 (86), (Washington, D.C.), January 1985; *Field Crops*, Statistical Bulletin No. 708, and various other issues.

Table 10. Comparative Yields in Metric Tons per Hectare of Selected Soybean Producing Countries.

Area	1975-76	1979-80	1981-82	1982-83	1983-84	Prelim. 1984-85	Proj. 1985-86
U.S.	1.94	2.16	2.03	2.15	1.76	1.89	2.29
Canada	2.32	2.37	2.18	2.35	2.02	2.24	2.50
Argentina	1.60	1.80	2.09	2.09	2.41	1.99	2.18
Brazil	1.72	1.73	1.56	1.56	1.65	1.82	1.41
Australia	1.73	1.83	1.67	1.67	1.85	1.76	1.55
World	1.65	1.82	1.73	1.73	1.64	1.73	1.84

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-78, April 1978; FOP 5-83, May 1983; *Foreign Agriculture Circular, World Crop Production*, WCP 4-82, April 12, 1982; WCP 3-84, March 9, 1984; WCP 4-85, April 1985; WCP 4-86, April 1986; and personal communication with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

Table 11. Pork Production in Major World Producing Areas, 1974-78 Average and 1980 through 1986 in Millions of Metric Tons.

Area	1974-78 Average	1980	1981	1982	1983	1984	Prelim. 1985	Forecast 1986
U.S.	5.9	7.5	7.2	6.5	6.9	6.7	6.7	6.6
Other N. America	1.5	1.8	1.7	1.8	2.0	1.8	1.8	1.8
S. America	1.0	1.2	1.2	1.2	1.2	0.8	0.8	0.9
EC-10	8.2	9.1	9.5	9.4	9.7	9.7	9.9	10.1
Other W. Europe	1.9	2.4	2.3	2.5	2.5	2.5	2.5	2.5
E. Europe	6.3	6.9	6.6	6.4	6.6	6.5	6.5	6.6
USSR	5.2	5.2	5.2	5.3	5.8	5.9	5.8	5.9
Asia (Exc. PRC)	2.0	2.7	2.6	2.6	2.8	2.9	3.2	3.1
Oceania	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
China (PRC)	8.7[b]	N.A.	11.9	12.7	13.2	14.4	16.5	17.0
World Total[a]	40.9	37.0	48.4	48.6	50.7	51.6	54.0	54.7

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; and FL&P 1-85, April 1985; and FL&P 1-86, March 1986.

[a] Totals may not add due to rounding.

[b] Average production for 1976-80.

Table 12. Beef and Veal Production in Major World Producing Areas, 1974-78 Average and 1980 through 1986 in Millions of Metric Tons.

Area	1974-78 Average	1980	1981	1982	1983	1984	Prelim. 1985	Forecast 1986
				(Carcass Weight)				
U.S.	11.5	10.0	10.4	10.4	10.7	10.9	11.0	10.5
Other N. America	2.2	2.2	2.3	2.4	2.3	2.3	2.4	2.4
S. America	6.1	6.3	6.6	6.4	6.2	6.1	6.3	6.3
EC-10	6.6	7.0	6.9	6.6	6.9	7.4	7.3	7.0
Other W. Europe	1.1	1.3	1.2	1.2	1.2	1.1	1.1	1.1
E. Europe	2.5	2.5	2.3	2.5	2.4	2.5	2.4	2.4
USSR	6.7	6.6	6.6	6.6	7.0	7.2	7.4	7.4
S. Africa	0.5	0.6	0.5	0.6	0.7	0.7	0.6	0.6
Asia (Excl. PRC)	0.8	1.0	1.0	1.0	1.0	1.1	1.1	1.1
Oceania	2.4	2.0	1.9	2.2	1.9	1.7	1.8	1.9
Total	40.4	39.5	39.7	39.9	40.3	41.0	41.4	40.7

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; FL&P 1-85, April 1985; and FL&P 1-86, March 1986.

Table 13. Total Poultry Production in Major World Producing Areas, 1974-78 Average and 1980 through 1986 in Millions of Metric Tons.

Area	1974-78 Average	1980	1981	1982	1983	1984	Prelim. 1985	Forecast 1986
U.S.	5.3	6.6	6.9	7.0	7.2	7.4	7.8	8.2
Other N. America	0.8	1.0	1.1	1.1	1.1	1.2	1.3	1.2
S. America	1.0	1.8	2.0	2.1	2.1	2.0	2.1	2.2
EC-10	3.4	3.9	4.1	4.4	4.3	4.3	4.3	4.4
Other W. Europe	0.9	1.2	1.2	1.2	1.1	1.1	1.1	1.1
E. Europe	1.6	1.9	2.0	1.8	1.8	1.9	2.0	2.0
Soviet Union	1.5	2.1	2.3	2.4	2.6	2.7	2.8	2.9
Africa	0.2	0.5	0.5	0.5	0.6	0.6	0.7	0.7
Japan	0.9	1.2	1.1	1.2	1.3	1.3	1.4	1.4
Other Asia and Oceania	0.4	1.0	0.8	0.7	0.8	0.8	0.9	0.9
Total	16.1	21.2	22.0	22.5	22.9	23.1	24.2	25.2

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; FL&P 1-85, April 1985; and FL&P 1-86, March 1986.

U.S. Shares of World Wheat and Coarse Grain Continue Down

Preliminary data indicate U.S. shares of global wheat and coarse grain exports fell sharply in 1985-86. For wheat, the decline was the fourth consecutive year, with the U.S. share of world trade dropping from 35.6 percent the previous year to 29.2 percent in the trade year just ending. The U.S. share of world coarse grain trade declined for the second consecutive year, dropping to 43.5 percent compared with a 56 percent share the previous year and a 62 percent trade share as recently as 1981-82. In effect, total non-U.S. exports of wheat and coarse grain exports have increased substantially in the last four years, while U.S. exports have been in a steep downward trend. The decreasing U.S. share in 1985-86 reflected large foreign grain supplies and aggressive pricing by most other exporters despite the weaker U.S. dollar. The rapid decline in the U.S. trade share was a key factor triggering major changes in U.S. farm price support policies and export programs in 1986.

Competition in wheat exports this season has been especially strong from the EC, Australia, and Canada, with these areas increasing their respective shares of global wheat exports by 2.2, 3.4, and 1.6 percent from 1984-85 levels. Among major non-U.S. wheat exporters, only Argentina's trade share declined in 1985-86, and that was due primarily to adverse weather and sharply lower Argentine production. The EC's wheat exports are approximately the same size as those of Canada and Australia, and its share of world wheat trade has risen from 15.3 percent in 1981-82 to its present 17.8 percent share. However, the Australian market share has increased much more sharply than EC, rising from 10.9 percent four years earlier to a preliminary estimate of 19.9 percent in 1985-86 (see Figure 17). The U.S. wheat export share reached a peak of approximately 50 percent in the early 1970s and has been in an irregular downward trend since that time. The 1985-86 U.S. share is expected to be slightly below the level of 14 years earlier.

Long-Term Trend in Wheat Trade Patterns

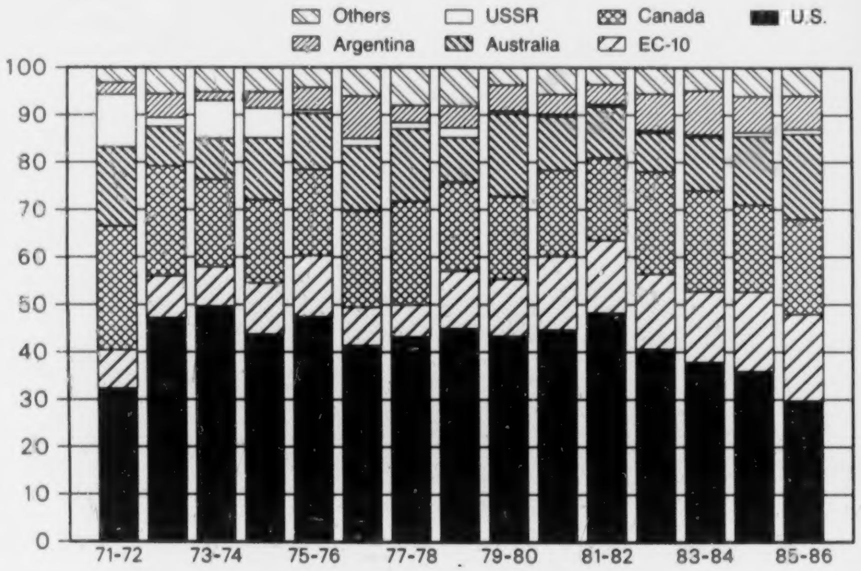
From a longer-term perspective, the U.S. share of global wheat trade increased rapidly in the early 1970s as U.S. wheat growers and the U.S. grain trade responded quickly to rising world demand. Profits from expanded world demand and changing government programs brought more than a 50 percent increase in planted U.S. wheat area in only four years' time. A private enterprise economic system, combined with increased grain merchandising profits, quickly generated additional investments in U.S. grain handling and transportation capacity, thus enabling increased production to be moved into export markets. Along with these developments, a depreciation of the U.S. dollar increased the purchasing power of foreign buyers as well as the competitiveness of U.S. wheat relative to that of foreign competitors. Meanwhile, with a time lag, foreign wheat production began to rise due to increased use of fertilizer, higher yielding varieties, and increased plantings in some areas (see Figure 18). This was particularly true in EC and Argentina, which both experienced steadily increased wheat export shares in the late 1970s and early 1980s. Trade shares of the other two major wheat exporters, Canada and Australia, fluctuated significantly from year to year due to more variable climatic conditions and greater variability of production.

In the next few years, the U.S. may experience a stabilizing of its wheat export share due to changing U.S. trade, grain reserve and price support policies, and the lower exchange rate of the U.S. dollar relative to foreign currencies. The EC farm policies continue to be directed toward self-sufficiency in agricultural production with internal price supports that encourage production, discourage consumption, and subsidize exports. Even with an increase in EC wheat feeding, that area will likely continue to offer strong competition in world wheat trade. In addition, Argentina has recently reduced its grain export taxes and also has a tax on idle farmland.[12] Both developments should encourage increased grain production and exports. Also, Canada is taking steps to expand its grain handling and transportation capacity, with the stated goal of sharply increasing its grain exports. These developments will be met by dramatic changes in U.S. grain trading and price support programs, as will be noted in the policy section of this report.

Coarse Grain Export Shares

After temporarily surging upward in 1979-80, the U.S. share of global coarse grain trade dropped back to about the 60 percent level for the next four years. That was approximately the same trade share the U.S. had obtained during the 1972-73 to 1978-79 period. Then in 1984-85, the U.S. share of world coarse grain trade dropped to 56 percent from 62 percent the previous

Figure 17. Percentage Shares of World Wheat Trade by Major Exporters, July-June, 1971-72 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 5-86 (Washington, D.C.), May 1986 and various other issues.

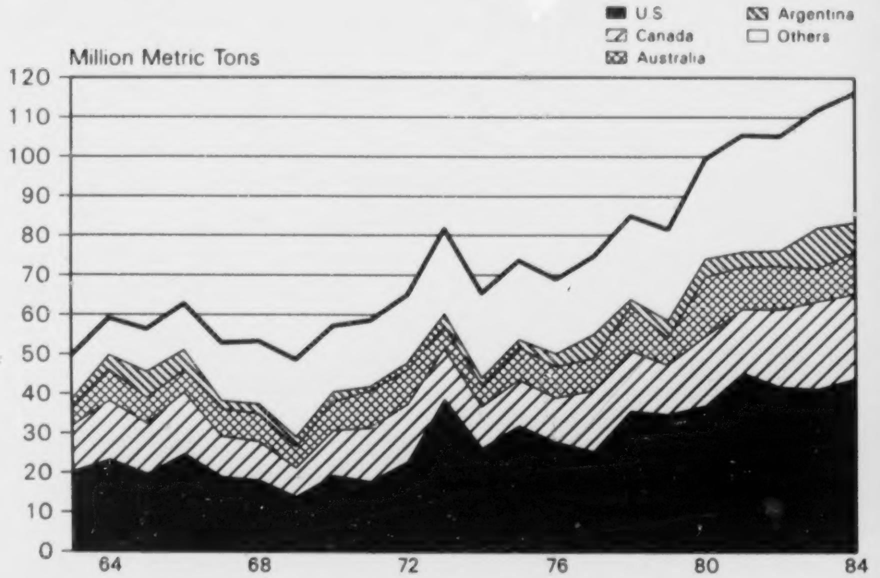
year, and declined further to preliminary estimates of 43 percent in 1985-86. Except for 1974-75 when the U.S. corn (maize) crop was severely reduced by drought, 1985-86 represented the lowest U.S. share of global coarse grain exports since 1971-72. The declining U.S. trade share in 1985-86 reflects increasing export shares originating in Western Europe, as well as continued exports from the People's Republic of China (including the "Others" category in Figure 19).

South Africa's corn crop was struck by severe drought in 1983 and 1984 and temporarily prevented that nation from maintaining its normal position as the world's third-ranking corn exporter. However, somewhat improved weather and increased 1985 production allowed that nation to resume modest corn exports in 1985-86. As shown in Figure 19, export shares of most other major coarse grain exporters including Canada, Australia, Thailand, and Argentina have varied considerably from year to year. These nations normally do not carry reserve grain stocks; thus weather fluctuations are a major factor behind year-to-year variations in their respective shares of world coarse grain trade. A 1984 drought sharply reduced Canada's share of world coarse grain exports in 1984-85. However, slightly improved production allowed its trade share to rise in 1985-86.

Figures 20 and 21 show the dramatic rise in U.S. corn and coarse grain exports in the 1970s, while non-U.S. exports during the same period remained relatively stable. From 1979 to 1985, however, U.S. corn exports fell by 40 percent, while corn exports from all other nations as a group rose by 78 percent. As a result, U.S. corn exports declined more sharply than the world total and brought severe financial pressures to U.S. grain producers, grain and farm supply firms, the U.S. grain transportation industry, and port elevators.

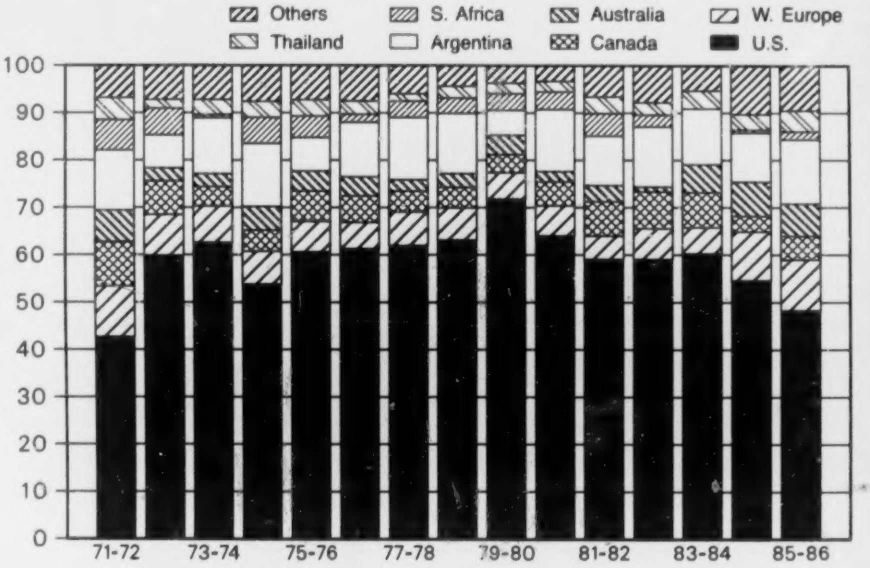
Prospects for the U.S. share of coarse grain exports in the next few years are uncertain and will depend on: (1) U.S. price support, grain reserve, and acreage control policies; (2) exchange rates of the U.S. dollar against foreign currencies; (3) Soviet grain production and consumption levels; (4) world economic growth rates; and (5) weather in major U.S. and foreign coarse grain exporting areas. At this writing, demand indicators point to steady to slightly increased global coarse grain exports through the late 1980s and early 1990s. If this proves correct, U.S. corn and

Figure 18. World Wheat Exports by Country of Origin, Calendar Years 1963-84.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figure 19. Percentage Shares of World Coarse Grain Exports by Major Exporters 1971-72 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 5-86 (Washington, D.C.), May 1986 and various other issues. Marketing year data were accumulated on a July-June basis from 1970-71 through 1978-79. The USDA switched to an October-September fiscal year starting in 1979-80.

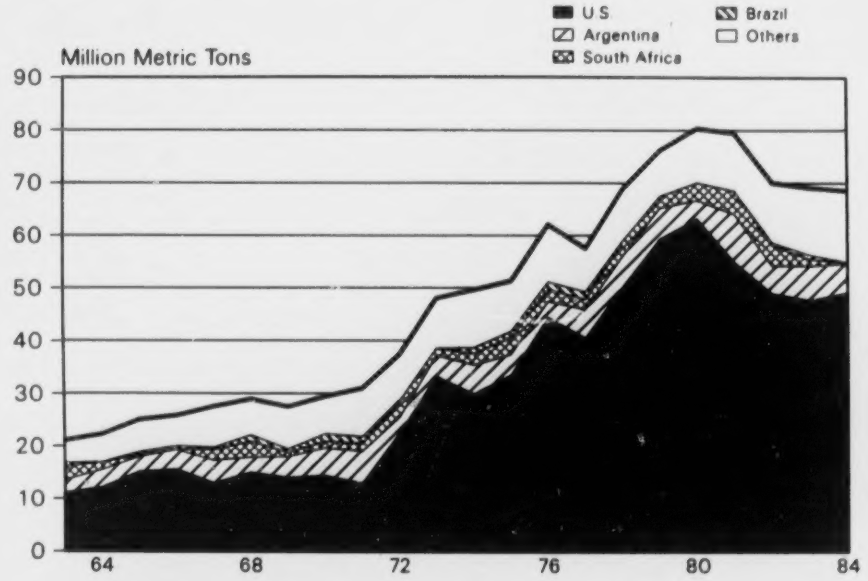
coarse grain exports likely will continue to face strong foreign competition in the next few years. However, changing U.S. farm policies should help to stabilize the U.S. share of world coarse grain trade.

In the event of a sharp upturn in world trade, U.S. corn and coarse grain exports likely could be increased more rapidly than those of foreign competitors, with a resulting increase in the U.S. trade share. Unlike most other coarse grain exporting nations, the U.S. has substantial excess handling and exporting capacity, land currently being idled from production, and reserve grain stocks that could quickly be used to meet expanding world demand.

Figures 19 through 21 illustrate that despite the recent lower level of world exports and a declining trade share, U.S. corn and coarse grain exports are of major importance to foreign livestock industries. U.S. exports still account for nearly two tons of corn out of every three traded in world markets and only slightly less than half of all coarse grains moving into international trade. These grains are used primarily for livestock and poultry feed in industrial and rapidly developing nations.

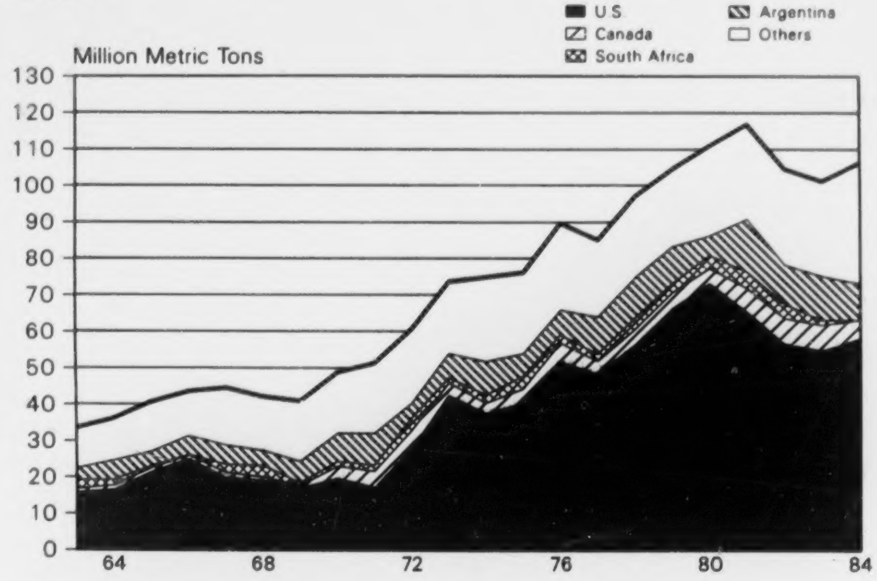
Other major coarse grain exporters include Argentina, France, Canada, and Thailand. South Africa is likely to regain its former position as the world's third-ranking corn exporter in the next few years, with a return to more normal weather in its grain belt. Despite policies intended to encourage a return to its former corn export position of the 1960s and early 1970s, Brazil remains a net corn importer. Even though long-term sales commitments have been made with the USSR, recent performance suggests Brazil is likely to have difficulty in reemerging as a significant corn exporter on a consistent basis in the next few years. Restraints on Brazilian production potential include more attractive alternatives in competing crops, high costs of fertilizer and other purchased inputs, and difficulties of accumulating capital and financing production in a high inflation economy.

Figure 20. World Corn Exports by Country of Origin, Calendar Years 1963-84.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figure 21. World Coarse Grain Exports by Country of Origin, Calendar years 1963-84.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Soybean and Soybean Product Trade Shares

Soybeans

The U.S. share of global soybean trade declined substantially in 1983-84 and 1984-85, but has turned upward in 1985-86 (see Figure 22). Preliminary data place the current U.S. share at 78 percent, down from an average of over slightly 80 percent in the 1975-76 through 1983-84 period. The recent decline in U.S. share was offset by increased exports from Argentina, China, and Paraguay. Other contributing factors behind the slight decline in U.S. soybean export share included the strong U.S. dollar in the 1981-85 period and U.S. price support programs.

Much of the decline in U.S. and world exports in 1983-85 reflected reduced demand for soybeans and soybean meal in Western Europe. Factors contributing to that area's reduced demand included: (1) an aggressive EC program to reduce surplus dairy production; (2) increased wheat feeding, with a resulting decline in protein meal needs since wheat has a higher protein content than corn; (3) a stabilizing of EC livestock and poultry production; and (4) large imports of U.S. corn gluten feed and meal as an alternative protein source. The dairy reduction program reduced protein feed demand in that sector of EC agriculture.[13] In addition, the strong U.S. dollar placed U.S. soybeans and meal at a competitive disadvantage relative to foreign supplies, and debt problems have restrained demand growth in developing nations. These restraints on world soybean exports have eased some in 1985-86.

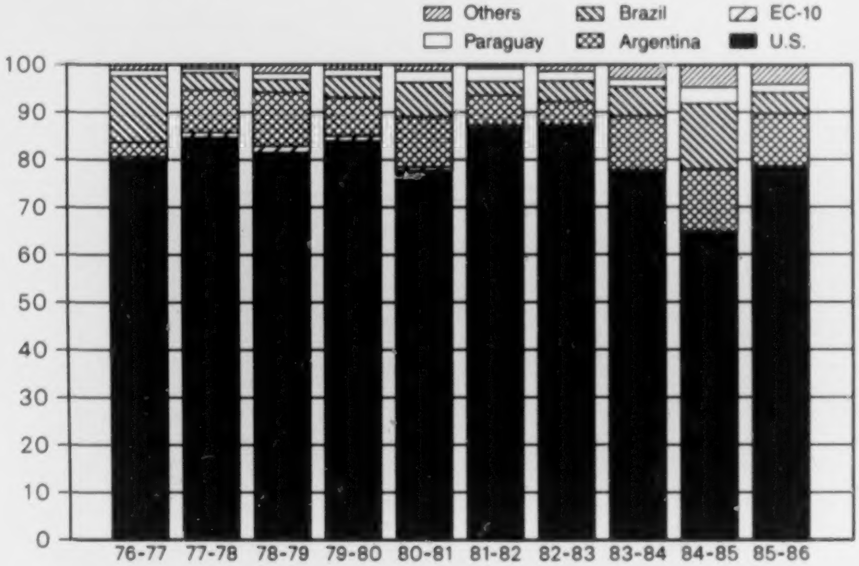
The U.S. soybean trade share in the next few years will be influenced strongly by the timing of any major recovery in foreign demand for beans and meal. With a continued static demand situation, the U.S. trade share can be expected to remain under pressure from South American competition. But with an uptrend in demand, U.S. producers would likely be able to expand production more quickly and more aggressively than their foreign counterparts, thus increasing the U.S. share of world trade. World soybean trade has experienced brief periods of decline in some previous years, but has shown a remarkable capacity to rebound when global economic growth resumes its upward trend. Rising consumer incomes are closely linked with increased demand for livestock and poultry products, and consequently have a strong tendency to generate increased demand for protein meal. An additional influence on future export trends is Soviet agricultural policies and priorities given to protein meal imports by that nation (see USSR section of this report). With the average protein content of Soviet livestock and poultry rations well below western standards, a strong case could be made for increased protein meal imports by that nation in the next several years.

Soybean Meal

The U.S. share of world soybean meal trade has declined much more sharply in recent years than that of unprocessed soybeans. The rate of decline accelerated in 1984-85, but has been partially offset by an increased U.S. export share in 1985-86. While nearly three-fourths of the soybeans traded in world markets are produced in the U.S., only about one-fifth of the soybean meal traded in world markets originates from U.S. processing plants. With strong foreign competition and depressed global demand for protein meal, U.S. soybean meal exports in 1984-85 for the first time dropped below those of the EC and Brazil (see Figure 23). In addition, Argentina has expanded its soybean processing capacity in recent years and additional capacity expansions are occurring in 1986. Thus, Argentina's share of world soybean meal trade also has increased sharply in the past four years and will likely increase further in the years immediately ahead. A high percentage of the soybeans processed in the EC are of U.S. origin, since climatic limitations have held that area's domestic production at extremely low levels. Spain and Portugal account for much of the soybean meal exports in the "Other" category of Figure 23, although these two nations joined the EC on January 1, 1986.

From a longer-term perspective, Brazil's share of world soybean meal exports has fluctuated from year to year with variations in the size of its crop. Its 1984-85 trade share was slightly below peak levels of the 1976-77 to 1977-78 period. The decline in the U.S. trade share since that time has come primarily from EC, Argentina, Spain, and Portugal. Increased trade shares by these areas reflect their governments' policies, which are designed to encourage exports of value-added products such as soybean meal and soybean oil. Value-added exports enable processing nations to benefit from increased domestic employment and retain any profits resulting from

Figure 22. Percentage Shares of World Soybean Trade by Major Exporters, October-September, 1976-77 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 5-83, May 1983; FOP 11-82, September 1982; FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; and FOP 5-86, May 1986.

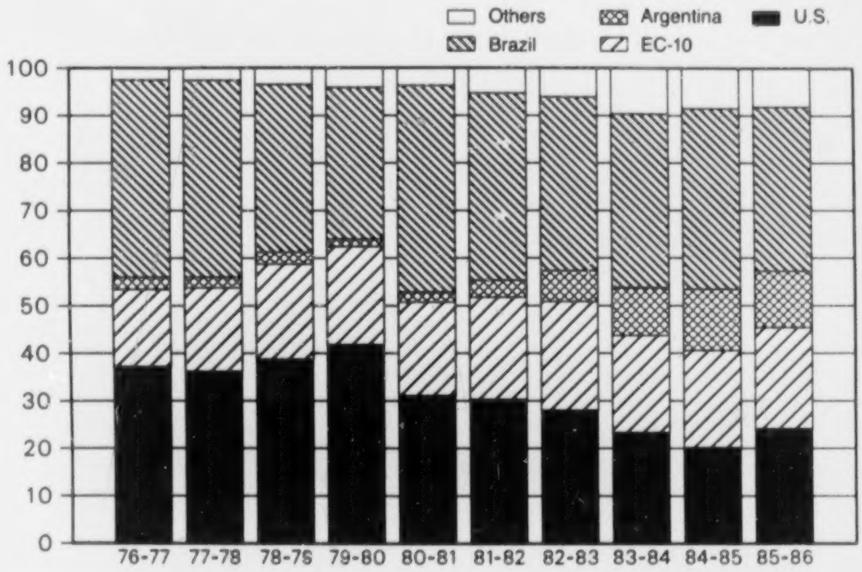
processing operations. Policies used to encourage such trade patterns include larger export taxes on beans than on bean products in South America and modest import taxes on soybean oil in west European nations.

Current trade policies of other meal exporting nations are strongly entrenched. With excess foreign processing capacity, the U.S. soybean processing industry likely will find intense competition in its efforts to maintain or expand its share of global soybean meal trade. In contrast to U.S. soybean export shares, the excess foreign processing capacity would make it difficult for the U.S. meal trade share to rebound sharply even in case of a strong recovery in world soybean meal demand.

Soybean Oil

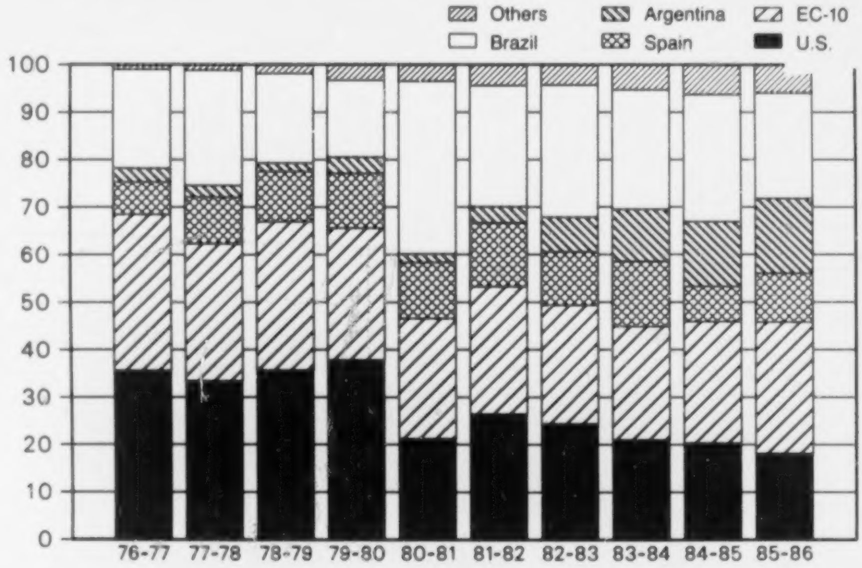
The U.S. share of global soybean oil exports has followed a pattern similar to that for soybean meal, except that the soybean oil share held approximately constant in 1984-85 and 1985-86. U.S. soybean meal's share of world trade, as noted in the preceding section, declined moderately in 1984-85. As with meal, the U.S. now ranks third in soybean oil exports, behind Brazil and EC (see Figure 24). Argentina's share has been increasing rapidly in the last few years and may well continue to trend irregularly upward in the remainder of the 1980s as that nation's soybean production and processing capacity expand. Competition from EC and Brazilian processing industries will depend heavily on trade policies of those areas as well as trends in Brazilian soybean production and domestic soybean oil consumption. With no major changes in trade policies, U.S. soybean oil exports appear likely to face continued strong competition from the nations shown in Figure 24 in the years ahead.

Figure 23. Percentage Shares of World Soybean Meal Trade by Major Exporters, October-September, 1976-77 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 5-83, May 1983; FOP 11-82, September 1982; FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; and FOP 5-86, May 1986.

Figure 24. Percentage Shares of World Soybean Oil Trade by Major Exporters, October-September, 1976-77 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 5-83, May 1983; FOP 11-82, September 1982; FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; and FOP 5-86, May 1986.

Trade Shares in Livestock Product Exports

Beef and Veal Exports

The U.S. share of world beef and veal exports has increased slightly over the past 15 years and an increase is expected in 1986. However, U.S. beef and veal exports still represent less than 5 percent of world trade and are dwarfed by much larger exports from Australia and EC. One reason for the limited U.S. beef exports is that most of the world's beef trade is in lower quality products rather than the highly finished beef typically produced in the United States. The U.S. beef export share was 3.2 percent of world trade in 1984 and is expected to reach 3.6 percent in 1986. As shown in Figure 25, that compares with a U.S. trade share of only 0.6 percent in 1970.

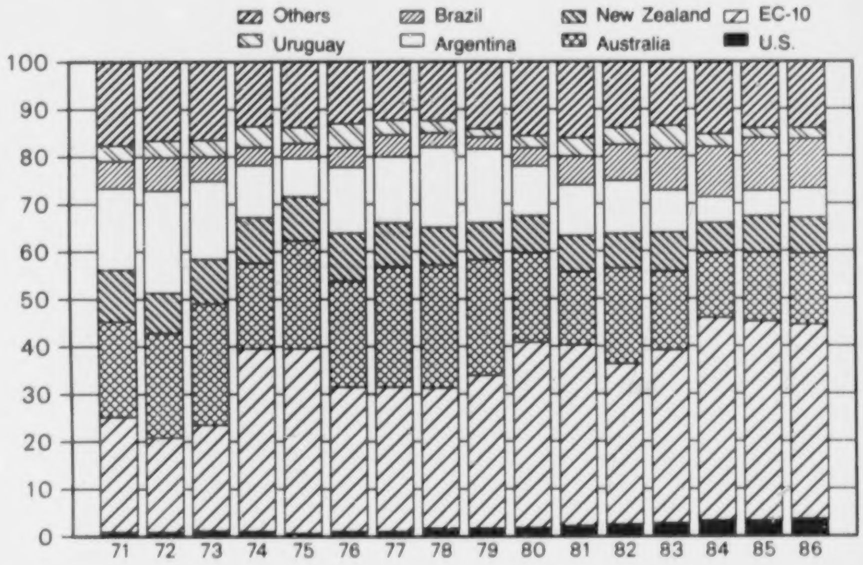
Major non-U.S. exporters of beef in order of importance include the EC, Australia, Brazil, New Zealand, Argentina, and Uruguay. The substantial long-term growth in EC's share of world beef exports since 1970 has come largely at the expense of Australia, Argentina, and New Zealand. Sizable yearly fluctuations in exports from Australia and Argentina reflect an unstable climate in those areas, with herd liquidation tending to increase supplies and depress prices during drought years. Conversely, when pasture and range conditions are favorable, producers tend to retain animals to rebuild herds, with a resulting decline in beef supplies.

Australia was in a herd expansion phase from late 1983 through 1985, after experiencing severe drought and herd liquidations in the early 1980s. Argentina's declining export share at least partially reflects that country's increased emphasis on wheat, corn, sorghum, sunflowerseed, and soybean exports as sources of foreign exchange earnings, and a resulting decrease in the amount of land devoted to pasture.

Pork Export Shares

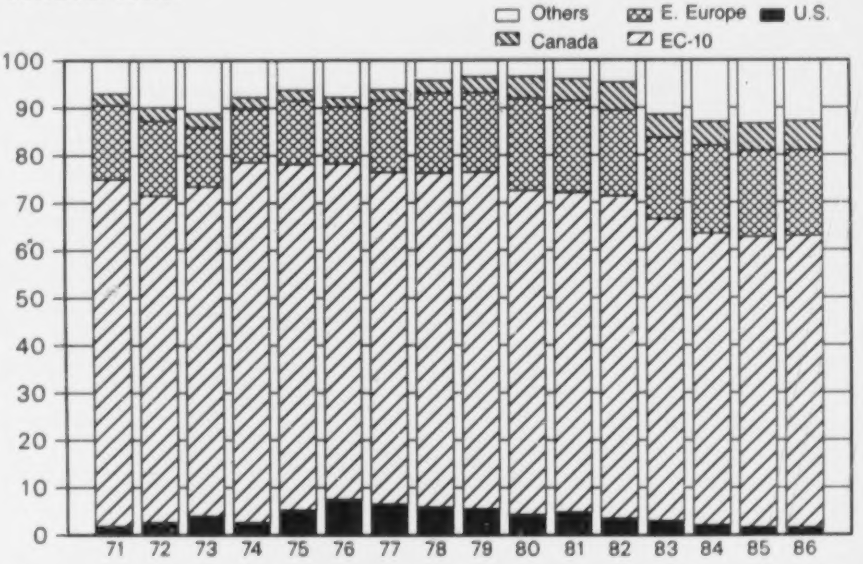
The EC also is the world's largest pork exporting area, with its exports since 1970 accounting for 61 to 77 percent of world pork trade as shown in Figure 26. However, its share of global exports has trended slightly downward since the mid-1970s. During the same period, Canadian and East European exports shares have increased slightly. The U.S. pork export shares reached a peak in 1976 and have been declining gradually since, partly because of strong European and Canadian competition. The U.S. share of world pork exports is expected to be approximately 1.5

Figure 25. Percentage Shares of World Beef and Veal Trade by Major Exporters, 1971-86 Calendar Years.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation* (Washington, D.C.), FL&P 2-83, May 1983; FL&P 1-84, April 1984, and FL&P 1-86, March 1986. *Foreign Agriculture Circular, Livestock and Meat* (Washington, D.C.), FLM 2-81, February 1981; FLM 2-80, February 1980; FLM 9-78 and 10-78, September 1978.

Figure 26. Percentage Shares of World Pork Trade by Major Exporters, 1971-86 Calendar Years.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation* (Washington, D.C.), FL&P 1-82, April 1982; FL&P 1-84, April 1984; and FL&P 1-86, March 1986; *Foreign Agriculture Circular, Livestock and Meat* (Washington, D.C.), FLM 2-81, February 1981; FLM 2-80, February 1980; FLM 9-78 and 10-78, September 1978.

percent in 1986, less than one-third as large as its record 1976 trade share. While some growth in U.S. pork exports is possible in future years, provided the U.S. dollar maintains a realistic level in foreign currency markets, U.S. producers continue to face sizable import barriers in other countries and strong competition from other pork exporting nations.

Poultry Meat Export Shares

As shown in Table 14, the U.S. share of world poultry meat exports has been in a downward trend since 1981. The U.S. poultry meat exports in 1986 are expected to account for approximately 14 percent of the world total, down from 20 percent in 1981. World poultry meat exports grew rapidly in the late 1970s and early 1980s but have trended slightly downward since 1981, as importing nations struggled with slower rates of economic growth and debt burdens. The declining U.S. trade share was influenced also by the strong U.S. dollar in the 1982-84 period and a resulting increase in cost to foreign buyers for purchases of U.S. poultry. In addition, debt pressures and high interest costs have encouraged Brazil and Eastern Europe to place greater emphasis on value-added exports as a means of earning foreign exchange. In the U.S., a shift in dietary patterns from red meat to poultry meat may have contributed somewhat to the decline in its export share. In the next few years, these same forces likely will continue to influence patterns of world trade in poultry meat.

Table 14. World Poultry Meat Exports by Major Exporters, 1974-78 Average and 1979 through 1986 in Thousands of Metric Tons.

Area	1974-78 Average	1979	1981	1982	1983	1984	Prelim. 1985	Proj. 1986
U.S.	148	228	375	261	225	209	210	209
Brazil	23	81	295	302	289	281	251	251
EC-10	473	605	830	826	836	771	662	627
E. Europe	173	196	289	312	297	304	306	300
World Total	853	1,156	1,837	1,741	1,684	1,602	1,471	1,440

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, FL&P 1-84, April 1984; FL&P 2-83, May 1983; FL&P 1-85, April 1985; and FL&P 1-86, March 1986.

Developments in Soviet Agriculture and U.S. Trade Relationships

With large year-to-year fluctuations in its grain production and imports (see Figure 27), the Soviet Union is a major influence on the volume of grain traded in world markets and has considerable impact on world grain prices. For example, approximately one-fourth of the world grain trade and one-third of all U.S. corn exports in 1984-85 were accounted for by Soviet imports. Its significance as a price influencing factor is caused not only by the size and variability of its imports, but also by its relationship to the Soviet Union's centralized grain purchasing system. Import decisions in USSR are made by a small group of government officials who can contract for the nation's entire yearly grain import needs in a very short time, if they wish to do so. This centralized purchasing system creates the potential for an ever-present element of surprise in Soviet buying patterns.

The USSR's initial entry into world grain markets in the early 1970s as a large and continuous grain importer was a classic example of this surprise element, with Soviet buyers dealing with several large grain firms and failing to disclose the total size of their import needs to any one firm or to U.S. Department of Agriculture officials in charge of the wheat export subsidy program. Since that time, grain merchandisers throughout the world have continuously watched Soviet weather, political developments, and other factors that might reveal likely purchasing patterns. The importance of this potential surprise element stands out when the USSR purchasing system is contrasted with that of Japan, another large grain importer. Japan's private enterprise system spreads purchasing decisions over a large number of individual decision makers, and the element of potential surprise is much less significant than with the Soviet Union. In addition, Japan's grain import levels are relatively stable from year to year. Consequently, only very minor world grain price reactions usually follow Japanese purchase announcements.

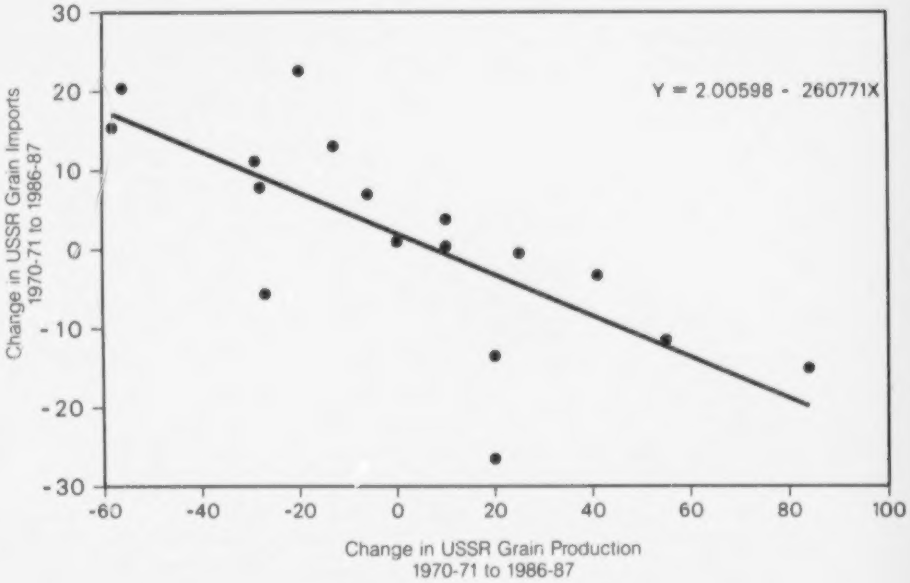
1985-86 Soviet Grain Imports Down from Previous Year Record

In 1984, a sizable part of the Soviet grain belt was struck by drought, with grain production dropping to the lowest level in three years and falling 10 percent below the average of the previous nine years. Production that year also was the sixth consecutive year in which Soviet grain production fell sharply below the officially planned level. With a series of poor crops, record or near-record livestock and poultry production, and low grain carryover stocks, Soviet grain imports in 1984-85 jumped to a record 55 million metric tons (July-June trade year), up 23 million metric tons or 72 percent from a year earlier. Previous record grain imports by the Soviet Union were 45 million metric tons in 1981-82, following an extremely low 160 million metric ton grain harvest. The following year, with moderately increased crop production, Soviet imports declined by 30 percent.

In 1985, Soviet grain production recovered moderately from the previous year's depressed level because of improved weather during the growing season. That triggered yet another large fluctuation in Soviet trade, with preliminary estimates of its total 1985-86 grain imports dropping 49 percent or 27 million metric tons below the previous year. Decreased Soviet imports were the main reason for a decline in world grain trade in 1985-86, with its wheat and coarse grain imports estimated to have fallen by 43 and 55 percent respectively.

Early indications are that Soviet grain production may decline in 1986 and its imports may rise in the 1986-87 trade year. Winter wheat production, which accounts for approximately one-third of the country's total grain harvest, reportedly experienced slightly heavier winter-kill than the unusually low level of 1984-85. In addition, both fall and spring planted crops have been affected to a still undetermined extent by the nuclear plant disaster on the northern edge of the Ukraine in April 1986. Also adding uncertainty to 1985-86 Soviet import requirements is the extent of groundwater and water reservoir contamination by radioactive materials and the resulting impact on livestock production. Reduced livestock production in the Ukraine, the nation's most important livestock area, could to some extent offset reduced grain production and temper any increase in Soviet grain imports. Also, Soviet foreign exchange availability for grain imports has been reduced substantially by the large decline in world petroleum prices in late 1985 and early 1986. Oil and gas exports are a major source of revenue for the Soviet Union.[14] The resulting decreased availability of foreign exchange might require some reordering of Soviet priorities on industrial growth, defense, and goals regarding increased per capita consumption of livestock and poultry products. A reduction in livestock herds because of

Figure 27. Relationship Between Changes in Soviet Grain Production and Imports, 1970-71 through 1986-87.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 25-76, October 7, 1976; FG 4-83, February 15, 1983; FG 7-85, May 1985; SG 5-86, May 1986.

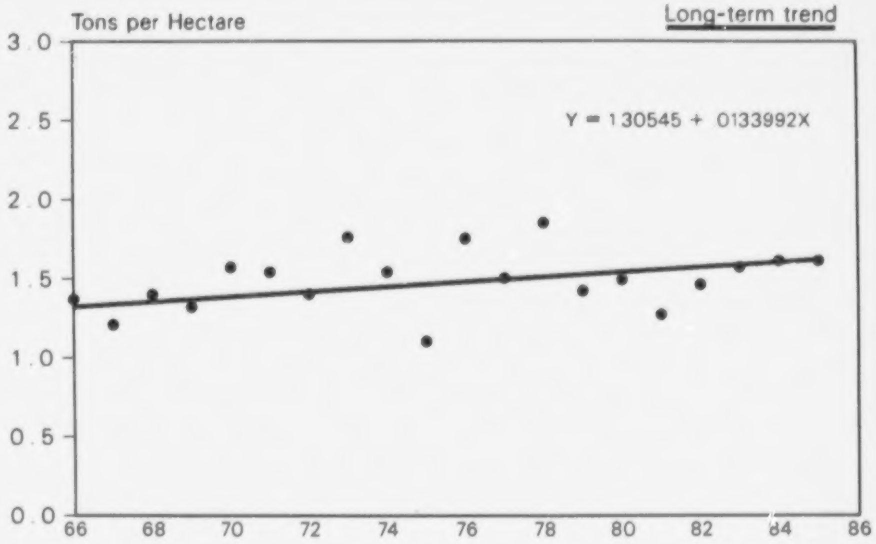
radioactive contamination, if that occurs, also could result in meat imports being increased by a greater percentage than grain imports.

Longer-Term Grain Production Prospects

Figure 28 shows little upward trend in Soviet grain yields since the early 1970s, and large year-to-year variability of yields. Future trends in Soviet grain imports will depend heavily on the success of that nation in reducing this annual yield variability and in overcoming an apparent inability to improve the productivity of its grain sector. Factors contributing to its two problems are complex and include climatic limitations from a grain belt that lies largely on a latitude similar to that of the Canadian prairie provinces. The resulting climate includes a short growing season and substantial risk of drought, as well as periodic problems from excessive rain or snow during the harvesting and winter wheat planting seasons. An additional uncertainty in long term production prospects is the extent to which soils might be contaminated for several years from the nuclear power plant disaster at Chernobyl. At this writing, most scientific observers believe long-term contamination problems are minor and will have little or no lasting impact on Soviet agriculture.

Along with climatic limitations, Soviet agriculture appears to face serious coordination problems from its state-controlled agricultural system. Such problems are evident from reports of a chronic lack of spare parts and disabled machinery during key field work periods, inadequate crop drying and transportation equipment at harvest, reports of harvesting and planting delays as farm workers wait for instructions on the individual day's activities, lack of the proper type and quantities of fertilizer at the time it is needed, and similar problems with other inputs. With a short growing season, optimum timing and coordination of all operations is essential for an efficient crop production sector.

Figure 28. Trend in Soviet Grain Yields in Metric Tons per Hectare, 1965-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 25-76, October 7, 1976; FG 4-83, February 15, 1983; FG 7-85, May 1985; SG 5-86, May 1986.

Table 15. Soviet Grain, Soybean, and Soybean Meal Importing Patterns in Millions of Metric Tons, 1975-76 through 1985-86.

	1975-76	1976-77	1977-78	1978-79	1980-81	1981-82	1982-83	1983-84	1984-85	Proj. 1985-86
Wheat Imports[a]	10.1	4.6	6.6	5.1	16.0	19.5	20.2	20.5	28.1	16.0
Coarse Grain Imports[a]	15.6	5.7	11.7	10.0	18.0	25.5	11.3	11.5	26.9	12.0
Total Imports, Wheat and Coarse Grains	25.7	10.3	18.3	15.1	34.0	45.0	31.5	32.0	55.0	28.0
Percentage from U.S. Origin[b]	54%	72%	78%	74%	24%	34%	20%	44%	28%	15%
Soybean Imports	1.7	1.5	0.9	1.8	1.4	1.5	1.1	1.0	0.9	2.0
Percentage from U.S. Origin	18%	62%	93%	67%	0%	40%	40%	50%	0%	0%
Soybean Meal Imports	0.0	0.1	0.0	0.5	1.0	1.1	2.8	0.8	0.6	0.6
Percentage from U.S. Origin	0%	100%	0%	10%	0%	0%	0%	0%	0%	0%

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* FG 23-82, July 16, 1982; FG 10-83, April 12, 1983; FG 7-85, May 1985; SG-8-84, June 12, 1984; SG-5-85, May 1985; SG-7-86, July 11, 1986; *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-81, March 1981; FOP 9-82, July 1982; FOP 4-83, April 1983; FOP 6-84, June 1984; FOP 6-85, June 1985; FOP 5-86, May 1986; U.S. Department of Agriculture, Agricultural Marketing Service (Independence, Mo.) *Grain Market News and Feed*, various issues; and U.S. Department of Agriculture, Foreign Agricultural Service, *U.S. Export Sales*, June 4, 1982, various issues.

[a] July-June trade years.

[b] Imports from U.S. origin are on October-September marketing years.

If radioactive contamination should prove to be a long-term problem in the Ukraine, coordination could be an even greater problem in other areas of the USSR grain belt, where the growing season is shorter and weather conditions are more variable. With increased reliance on those areas for grain production, the need to solve the coordination problem would become even more important.

While substantial time likely will be required to achieve improved coordination in the Soviet crop sector, the nation probably is now shifting in that direction. The top Soviet leadership position has been transferred to a relatively young person trained in agronomy and experienced in USSR agriculture. Massive Soviet grain and oilseed imports have absorbed foreign exchange that otherwise could have been used to improve industrial output, so a strong incentive exists for USSR to deal with lagging productivity in crop production. According to a recent U.S. Department of Agriculture publication, the current Soviet leader has emphasized streamlining and optimizing the current agricultural system, rather than making radical changes in the system itself. In the streamlining process, a move reportedly is under way to improve labor productivity through a collective contract system where worker remuneration is linked more closely with output.[15]

Other Soviet policies aimed at improving crop production include large investments called for in a long-term program to drain approximately 20 million hectares of potential cropland by the year 2000 and to extend irrigation to 30 to 32 million hectares.[16] Available investment funds and costs of the projects will determine whether these goals are attained. Other investment plans call for expanded grain storage and handling facilities to reduce spoilage losses and expanded production of fertilizer and farm machinery.[17] Soviet grain and oilseed yields likely will trend upward in the years ahead. However, the performance record of the last 15 years suggests that changes are likely to be gradual, and that the USSR will likely continue its large and variable pattern of grain imports for the next several years.

Oilseed Prospects

Prospects for Soviet oilseed and/or oilseed products are less clear than those for grain. Official plans call for sharp increases in oilseed production but so far little progress has been made in that direction (see Table 16). Soviet livestock rations contain extremely low protein contents by western standards. Increased protein meal imports could enable Soviet agriculture to more efficiently use limited grain supplies and also could improve productivity of its livestock and poultry sector. Accordingly, some Western analysts of Soviet agriculture believe the current leadership may place increased priority on oilseed and/or protein meal imports in the years immediately ahead. If long-term grain and livestock contamination problems from the nuclear power plant disaster should prove to be serious, that would increase the importance of up-grading protein levels in rations to improve productivity of the livestock and poultry sectors.

Livestock Sector

In the USSR livestock sector, aggregate Soviet livestock numbers expanded slowly in 1985, with preliminary estimates of 1986 total beef, pork, and poultry meat production reaching a near-record 16.2 million metric tons, 0.9 percent above a year earlier. Milk and egg production also expanded at similar rates. Use of grain in livestock and poultry feed in the USSR has fluctuated in a relatively narrow range in recent years, despite increased meat, egg, and milk production.[18] Thus, feed conversion efficiency of the Soviet livestock sector appears to be trending upward. Further increases in feed conversion efficiency appear likely in the years ahead through animal breeding and genetics, improved animal health and nutrition, better management, and related developments.

U.S.-USSR Grain Agreement

The current U.S.-USSR Grain Trade Agreement went into effect in October 1983 and will have a duration of five years. It requires the United States to make available and the USSR to purchase a combined minimum of 9 million tons annually of U.S. corn and wheat, up from 6 million tons in the prior agreement. The current agreement also allows 0.5 million metric tons of soybeans or soybean meal to be substituted for 1 million tons of grain, at the discretion of USSR, in meeting the minimum purchase commitment. In addition, the agreement permits USSR to purchase a combined maximum of up to 12 million tons of U.S. wheat and corn without prior consultation with the U.S. government. With consultation, additional purchases beyond the 12 million ton limit may be permitted. In the 1984-85 trade year, the U.S. administration offered to make as much as 27 million tons of U.S. corn and wheat available to USSR if it desired to purchase that quantity. However, actual Soviet purchases of U.S. grain were only about two-thirds that amount.

The long-term agreement is a continuation of the U.S. trade policy with the USSR initiated in the mid-1970s partly in an effort to bring greater stability in Soviet purchasing patterns and to reduce the element of potential surprise in its purchases. In nine years of such agreements, both sides continued to honor their minimum commitments until 1984-85 and 1985-86, when the USSR failed to meet its U.S. wheat purchase obligations. Soviet officials gave as their reason for failing to meet wheat commitments the fact that U.S. wheat was priced above that of other wheat exporters, and the U.S. had refused to grant USSR price concessions through its Export Payment-in-Kind program, which has been offered selectively to some wheat importers. Despite problems with wheat sales to the Soviets, it is highly likely that the USSR will continue as a large importer of U.S. corn and a sporadic importer of U.S. wheat, at least through the October 1987-September 1988 marketing year. Alternative non-U.S. supplies of corn are more limited than those for wheat and will likely encourage the Soviet Union to honor its long-term corn purchase commitments with the U.S. However, its total purchases of U.S. grain will likely continue to vary from year to year, depending on the size of the Soviet grain harvest, the availability of foreign exchange in USSR, and political relationships between the two nations.

Table 16. Soviet Oilseed Production in Millions of Metric Tons, 1972-73 through 1985-86.

	Soybeans	Cottonseed	Sunflower
Projected			
1985-86	.47	4.89	5.23
Preliminary			
1984-85	.47	4.76	4.52
1983-84	.56	4.82	5.06
1982-83	.50	5.09	5.34
1981-82	.45	5.28	4.65
1980-81	.53	5.08	4.62
1979-80	.40	4.14	5.41
1978-79	.63	4.67	5.33
1977-78	.54	4.69	5.90
1976-77	.48	4.51	5.28
1975-76	.78	4.81	4.99
1974-75	.36	4.53	6.78
1973-74	.42	4.36	7.39
1972-73	.26	4.09	5.05

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-84, April 1984; FOP 2-84, February 1984; FOP 11-83, November 1983; FOP 9-83, September 1983; FOP 13-82, November 1982; *World Crop Production*, WCP 4-85, April 1985; WCP 5-86, May 12, 1986.

Financial Developments Affecting U.S. and World Agricultural Trade

After accelerating sharply in 1984, U.S. economic growth slowed substantially in 1985 and is expected to continue expanding at only a modest rate through 1986 and early 1987. Since the U.S. has been leading the world economy out of the recession of the early 1980s, slower U.S. economic growth is expected to be a tempering influence on the world economy in the next 6 to 12 months. However, growth rates will continue to differ substantially from one area to another. Continued moderate economic growth is expected in Pacific Rim nations including the Republic of Korea, Japan, Taiwan, Hong Kong, Singapore, and Malaysia. Economies of these countries are expected to be supported by continued strong exports to the U.S., and reduced energy costs. Recent trends suggest West European economies may continue to experience a relatively slow economic expansion during the next 6 to 12 months, along with slow real economic growth in a number of heavily indebted developing nations. In general, these trends point to a continuation of the recent pattern of relatively slow growth of U.S. and world export demand for agricultural products for at least the next one to two years.[19]

Key Problem Areas

Global economic prospects for the years immediately ahead are closely related to three problem areas: (1) heavy indebtedness of developing nations as well as many private firms and individuals in developed economies, with accompanying large financial needs for debt servicing; (2) the exchange rate of the U.S. dollar; and (3) the level of real interest rates (nominal interest minus inflation rate), which affect debt-servicing costs, economic growth, the availability of consumer funds for food purchases, and agricultural production, processing, storage, and marketing costs.[20] These three areas are closely interrelated and stem at least partly from U.S. monetary and fiscal policies. The U.S. fiscal policy with its large federal budget deficit is highly stimulative to the U.S. economy. As a result, a relatively restrictive monetary policy has been required to control U.S. inflation and restrain the otherwise highly expansionary tendency of government spending and taxation policies. These diverging policies have created a strong U.S. government demand for credit, with resulting high domestic real interest rates, although real interest rates have declined considerably in the last year.

Since international investment capital moves freely and quickly from one country to another in search of maximum returns, capital movement into the U.S. has been heavy. The strong foreign demand for U.S. dollars for investment purposes has helped to support the U.S. dollar to some extent, although its value against major West European and some Pacific Rim currencies declined by about one-third from early 1985 to early 1986. These foreign capital flows into the United States have assisted in financing the U.S. budget deficit. In the early 1980s, the strong dollar reduced the cost of foreign products imported into the U.S. and retarded its inflation rate.

Other nations also have adopted more restrictive monetary policies in the past five years than in the 1970s, in an effort to retard capital outflows to the U.S. Resulting relatively high real interest rates, along with movement of investment capital to the U.S., have tended to hold non-U.S. economic growth well below the levels of the 1970s. At the same time, these interest rates have pushed inflation rates in most industrial nations well below the levels of the previous decade.

From time to time over the past five years, the interrelated problems of debt and high interest rates have caused uneasiness about the health of the U.S. and world banking systems. Concern has developed because of heavy involvement of some leading institutions in loans to developing nations that are experiencing difficulty meeting debt-servicing requirements. The system could be placed under severe pressure in case of widespread defaults on such loans. Other concerns about the banking system from time to time stem from debt burdens of private U.S. firms, as well as investment losses stemming from volatile interest rates and/or currency exchange rates. However, developing nations appear to be making gradual progress in reordering their economies to meet debt-servicing requirements, and concern over the international banking system appears to be somewhat diminished at this writing.

Debt Burdens of Developing Nations

Recent estimates of outstanding external debt in several developing nations are shown in Table 17. The three most heavily indebted developing nations include Brazil, Mexico, and Argentina, along with substantial debt burdens in Eastern Europe and several oil exporting nations. In Latin America, adjustments to debt burdens have generally involved a four-dimensional approach: (1) reduced government spending, (2) restructuring debts to lengthen repayment periods, (3) reducing nonessential imports, and (4) taking steps to increase exports. After severely reduced real economic output in many Latin American countries in the early 1980s, many nations in the region are now beginning to experience slightly positive real economic growth.[21] At the same time, however, exports of such countries as Brazil and Argentina are creating increased competition for U.S. agricultural exports. Heavily indebted nations are under strong pressure to restrain imports and increase exports to meet debt-serving costs. These pressures have been slightly reduced by lower interest rates and a resulting decline in debt-servicing costs. Recent weakness of the dollar and decreased costs for imported energy and other raw materials also have helped to ease debt burdens of oil-importing developing nations.

Table 17. Estimated Outstanding Debt of Selected Nations in Billions of U.S. Dollars in 1984.

	Total External Debt
S. Korea	35.0[b]
Poland	27.0[d]
Indonesia[a]	21.9[b]
Philippines	28.0[c]
Nigeria[a]	20.9[d]
USSR[a]	28.7[c]
Iran[a]	7.2[c]
Iraq[a]	5.3[c]
Israel	14.6[c]
Argentina	47.0[d]
Bolivia	3.2
Brazil	100.0[d]
Colombia	10.8
Costa Rica	4.1
Chile	18.4
Dominican Republic	2.9
Ecuador	6.9
El Salvador	2.3
Guatemala	1.9
Haiti	.6
Honduras	2.3
Mexico[a]	100.0[d]
Nicaragua	3.9
Panama	3.6
Paraguay	1.6
Peru	14.0[d]
Uruguay	4.7
Venezuela[a]	23.0[d]

Sources: *Wall Street Journal* (Chicago edition), various issues; and *Journal of Commerce*, May 6, 1985, January 6, 1986, February 14, 1986, May 6, 1986, and June 9, 1986.

[a] Oil exporting nations.

[b] 1982 debt levels.

[c] 1983 debt levels.

[d] 1986 debt levels.

However, the sharp decline in world petroleum prices appears likely to remain a major restraint on economic growth of Mexico, Venezuela, Nigeria, and other oil exporting developing nations. Relatively low energy export prices may worsen their debt-servicing problems while relieving debt problems of oil importing nations.

Exchange Rate Developments

From early 1985 to early 1986, the exchange rate of the U.S. dollar declined by approximately one-third in terms of the Japanese yen and several West European currencies. The lower exchange rate reflected several developments including easing of U.S. monetary policy, lower petroleum prices, which were expected to benefit West European importers and Japan more than the U.S. because of greater dependence on those nations on oil imports, and coordinated actions by a group of five industrial nations. The group of five included the U.S., United Kingdom, France, West Germany, and Japan. These nations agreed to coordinate monetary and fiscal policies in ways that would allow the U.S. dollar to decline in value relative to currencies of major industrial nations. Coordinated action by the group appears to have been triggered at least partly by strong pressures for protectionism in the U.S. Congress, to protect U.S. industries from low-cost imported products. The strong dollar during the 1981 to early 1985 period had substantially reduced the cost of many products imported into the U.S., and was an important contributor to the large and growing U.S. trade deficit.

Through mid-1986, U.S. agricultural exports, except for soybeans, showed little or no positive response to the weaker dollar. A decline in the exchange rate of the U.S. dollar tends to lower the cost of U.S. exports in foreign markets, and theoretically should encourage increased exports. However, grain prices to final users in most of Western Europe and wheat prices in Japan are largely insulated from exchange rate fluctuations.[22] Thus, the weaker dollar should not be expected to expand the demand for U.S. grain in these areas. In addition, U.S. grain exports continued to face strong competition in 1985-86 from near-record foreign supplies and restrained demand resulting from a sluggish world livestock economy. Unlike wheat and corn (maize) prices, soybean and soybean meal prices to foreign users are relatively free of artificial restrictions and are able to reflect exchange rate changes within a relatively short time. Thus, the weaker dollar may have been a contributing factor in the substantial increase from a year earlier in September 1985 to June 1986 U.S. soybean exports.

An additional factor limiting the response of U.S. grain exports to the declining dollar exchange rate against many West European and Japanese currencies is the continued strong dollar relative to other grain exporters and many developing nations. For example, while the U.S. dollar fell about 24 percent relative to the yen from September 1985 to March 1986, it rose 3 percent against the Canadian and French currencies, 10 percent against the Nigerian currency, 1 percent against the Pakistan currency, 94 percent against Brazil currency, declined only 2 percent against the Australian dollar, and remained constant relative to currencies of Argentina and Egypt.[23] Also, a declining dollar may have reduced the purchasing power of oil exporting nations since petroleum is priced in U.S. dollars in world markets. In short, the decline in the U.S. dollar's exchange rate has been only a slightly positive factor in U.S. agricultural trade through mid-1986, with most of the positive impact being on oilseeds rather than grains.

Future exchange rate impacts on U.S. agriculture will depend partly on whether a broader-based decline in the value of the U.S. dollar can be achieved, as well as on the availability of competing supplies in world markets. As long as supplies of foreign exporters are large, these nations appear likely to offer their products at whatever prices are needed to meet U.S. competition and move supplies into world markets. Over time, lower world prices stemming from U.S. price support and exchange rate policies should encourage increased growth of world grain utilization and increased agricultural trade. However, time lags of at least two to five years may well be involved before the full effects of a sustained lower U.S. dollar is noticed in agricultural trade patterns.

Update on China and India

During the 1970s, the world grain trade was shocked by the emergence of several countries and regions as large importers of grain. Included in this category were USSR, India, China, Eastern Europe, and Mexico. Some nations in this group had been significant grain exporters in the past. In the early 1980s, an opposite shift occurred as formerly large grain importing regions moved to an exporting position. Even more significant, two of the nations involved (China and India) are densely populated and represent over one-third of the world's population.

China emerged as a significant grain and soybean oil importer in the mid-1970s in an effort to maintain and improve the diets of its population of approximately one billion people. India, at times during the mid-1960s and 1970s, experienced serious food problems and imported large volumes of U.S. wheat and other farm products. But by 1984-85, both India and China were exporting modest quantities of grains and oilseeds or oilseed products to other Far East nations. Trade sources indicate these two countries also may have exported some grain and protein meal to USSR in 1984-85.

China

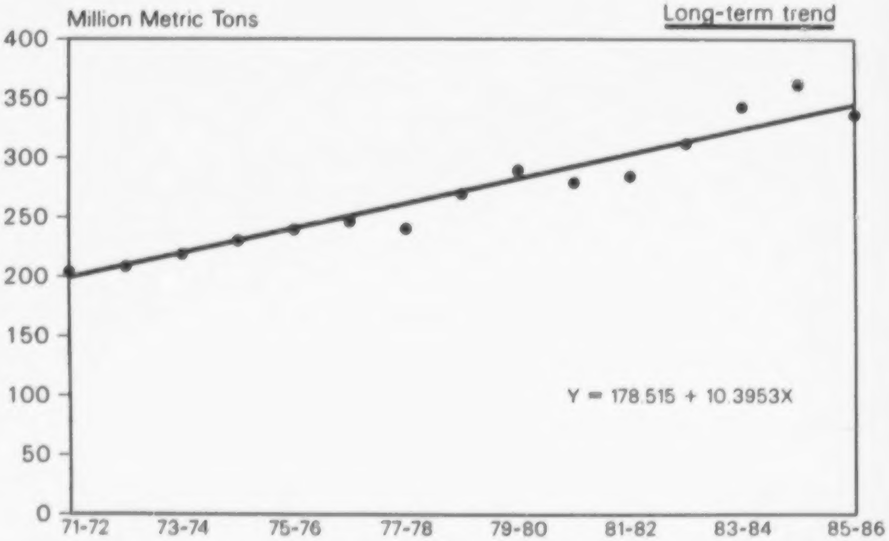
China's grain production has grown at an accelerating rate since the mid-1970s through the combined effects of increased use of technology and changes in its economic system, although the growth rate was temporarily interrupted in 1985-86 by unfavorable weather (see Figure 29). Technological developments include the construction of a large number of new fertilizer plants and increased use of fertilizer, improved varieties, and changes in government policies to encourage research. In the late 1970s, China also changed its economic system to allow farm workers greater freedom in managing production and to provide individual economic incentives to farm workers to market excess production in return for cash payments.[24] Increased domestic grain production moved China into a net exporter position in corn and soybeans during the last three years. Its exports have competed with U.S. grain and soybeans in Korea, Japan, and USSR.

Future trends in Chinese grain and soybean exports will depend on China's ability to generate further technological improvements in production through its expanded agricultural research program, as well as trends in urban food consumption patterns.[25] An expected upward trend in Chinese per capita income and a likely increase in consumption of meat and poultry may moderate the expansion of Chinese grain and oilseed exports and could eventually return that nation to an importing position.

India

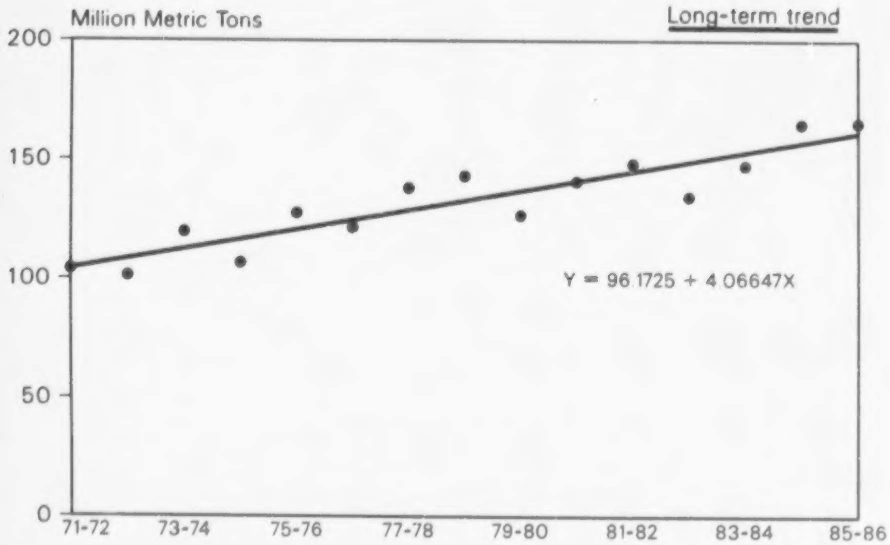
India is the second most populous nation in the world. Its climate has been somewhat more variable than that of China, partly because Indian grain production is heavily dependent on monsoon rains. As shown in Figure 30, India has made impressive strides in grain production in recent years through the use of improved technology. Grain production has been increased by higher yielding varieties, expanded use of fertilizer and irrigation, and improved management. These same factors appear likely to push Indian grain production irregularly higher in the next few years. But with its population of over 700 million people and somewhat variable weather patterns, it seems likely that India will continue to alternate from a grain exporting to an importing position from time to time from now through the mid 1990s. During the past three years, it has been a small exporter of wheat but has still accumulated record carryover stocks.

Figure 29. Trend in Chinese Grain Production, 1970-71 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 6-85, April 1985, FG 5-86, May 1986, and various other issues.

Figure 30. Trend in Indian Grain Production 1970-71 to 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 9-76, May 1976; FG 20-78, November 1978; FG 5-80, February 1980; FG 4-81, January 28, 1981; FG 13-82, April 26, 1982; FG 26-83, September 9, 1983; FG 19-83, November 8, 1983; FG 2-85, January 1985; FG 7-85, May 1985; and FG 5-86, May 1986; *World Crop Production* (Washington, D.C.), WCP 5-86, May 12, 1986.

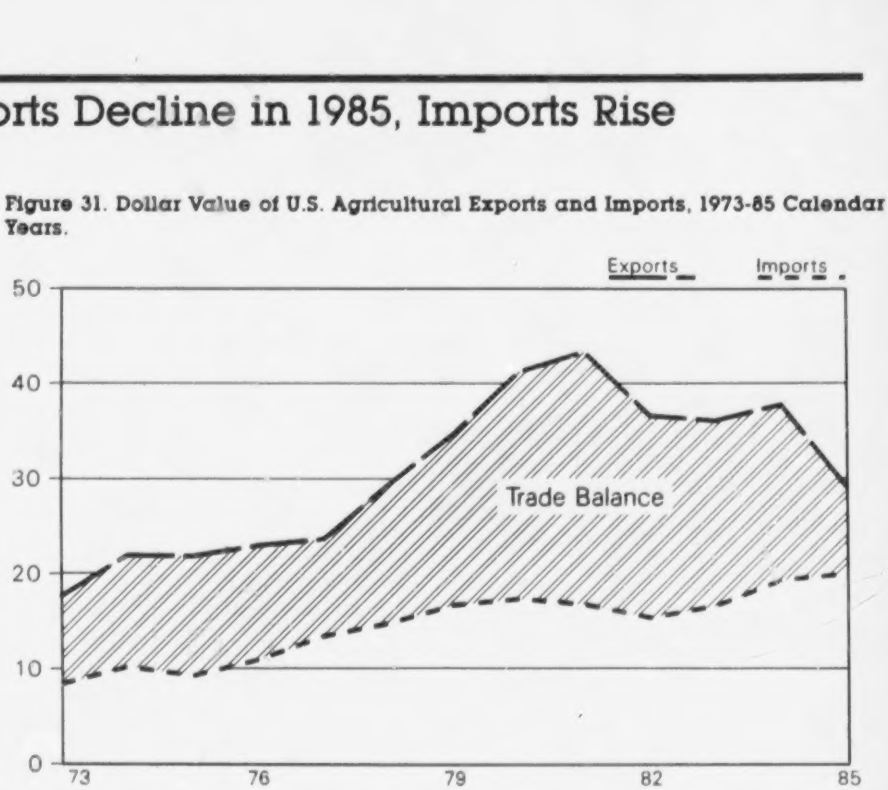
U.S. Agricultural Exports Decline in 1985, Imports Rise

U.S. agricultural exports continued their five-year decline in calendar year 1985, after a brief upward deviation from that trend the previous year because of temporarily higher farm prices stemming from the 1983 drought and Payment-in-Kind program (see Figure 31). Declining U.S. exports in 1985 and early 1986 reflected lower prices for most major U.S. agricultural products, as well as sharply reduced physical volumes of U.S. grains being exported. The volume of U.S. exports remained in a downward trend as a result of large supplies available from competing agricultural exporters at competitive prices, increased self-sufficiency of many importing nations, and slower growth in world consumption of farm products than in the 1970s. Tentative projections place 1985-86 total U.S. agricultural exports at $27.5 billion, 12 percent below a year earlier and 37 percent below the 1980-81 record.

U.S. agricultural imports also trended upward in calendar year 1985 but are expected to stabilize in 1986. The nation's total imports of all agricultural products last year reached a record $19.97 billion, up 3 percent from 1984, but reflecting a much slower growth rate than the previous year's 17 percent. Slower growth in U.S. agricultural imports in part reflected the sharp decline in the exchange rate of the U.S. dollar against many foreign currencies. The weaker dollar tended to increase the cost of imported goods relative to domestically produced farm products. With imports valued at $19.97 billion and agricultural exports at $29.03 billion, the U.S. net trade surplus in farm products shrank to only $9.1 billion, slightly less than one-half the level of the previous year. That was the lowest net surplus in U.S. agricultural trade since the early 1970s and also was accompanied by a sharp deterioration in the U.S. nonagricultural trade balance.

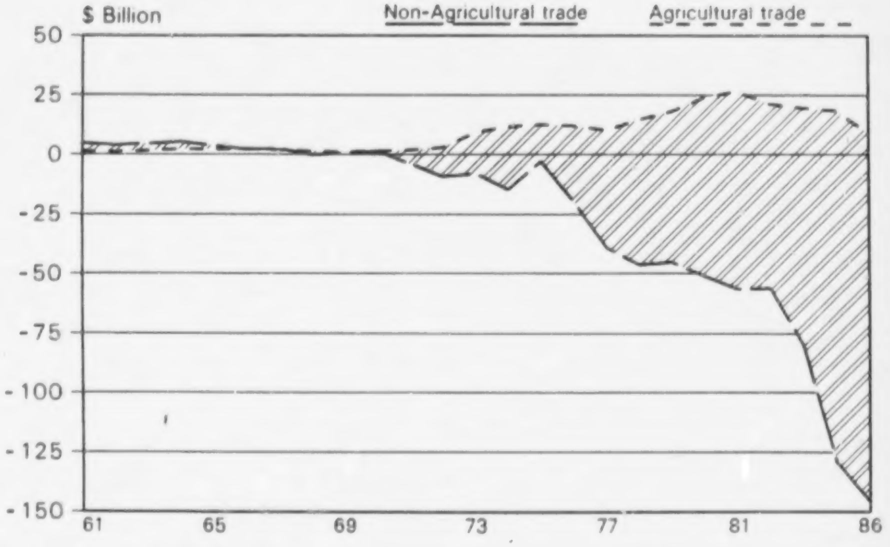
The declining U.S. agricultural trade balance is a matter of serious concern to both the agricultural and nonagricultural sectors of the U.S. economy. For the agricultural sector, it means a loss of income and continued financial problems in production agriculture, reduced demand for inputs such as farm machinery, seed, fertilizer, chemicals, livestock facilities, and equipment. It also means reduced employment in these and other sectors supplying agriculture, as well as in processing, handling, transporting, and exporting farm products. Reduced income and employment in these areas have a negative multiplier effect on economic activity in rural communities as

Figure 31. Dollar Value of U.S. Agricultural Exports and Imports, 1973-85 Calendar Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues.

Figure 32. Net U.S. Trade Balance in Agriculture and Nonagricultural Products by Calendar Years, 1961-85.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues.

farm families reduce expenditures for farm and nonfarm items, with a resulting decline in agriculturally related employment as well as economic activity in main-street businesses.

At the national level, the net trade surplus in agriculture traditionally has helped to pay for a substantial part of the imports of nonfarm products. In that way, it has contributed to the economic well being of the U.S. population and also helped to stabilize the exchange rate of the U.S. dollar so that imported items remain reasonable in cost. However, the U.S. nonagricultural trade balance continued to deteriorate sharply in 1985 as shown in Figure 32, and now is so large that the modest trade surplus in agriculture offsets only a small part of the total trade deficit. The huge and growing deficit in the nonagricultural sector is due partly to major imbalances in U.S. monetary and fiscal policies. Fiscal policies reflect major federal budget deficits, with a need for those deficits to be financed partly through foreign investments in the U.S. That has created a strong demand for U.S. dollars abroad to be recycled back into the U.S. for investment purposes. And with a somewhat restrictive U.S. monetary policy, the financial market mechanism has caused those dollars to be supplied to foreign investors through large U.S. imports. Nonagricultural U.S. exports in 1985 totaled $177.9 billion, up 2 percent from the previous year. At the same time, nonagricultural imports rose to $323.6 billion, a 7 percent increase from 1984. The resulting deficit in nonagricultural U.S. foreign trade of $145.7 billion far outweighed the $9.1 billion agricultural trade surplus. For comparison, the U.S. nonagricultural trade deficit in 1984 was $129.5 billion, and the U.S. agricultural trade surplus was $18.5 billion.

The large and growing U.S. trade deficit, if it is not dealt with soon, has important implications for U.S. economic growth and interest rates, as well as for the economic health of U.S. agriculture and other sectors heavily dependent on exports and/or sensitive to import competition. Policy tools for dealing with this problem will be discussed in a later section of this report. Preliminary indications point to a continued large U.S. trade deficit in 1986, along with at least a moderate further decline in agricultural exports because of lower commodity prices than a year earlier and reduced volumes of grain exports. Tentative U.S. Department of Agriculture forecasts in mid-May 1986 indicated the fiscal 1985-86 U.S. agricultural trade balance will drop to $7.5 billion, one-third less than a year earlier and the lowest since 1973. The forecast includes a 12 percent decline from the previous year in U.S. agricultural exports and almost unchanged U.S. agricultural imports.[26]

Reduced exports have been one of several factors behind continued severe economic pressures in U.S. agriculture and a recent sharp decline in asset values in the U.S. agricultural sector. For the next several years, given approximately normal weather in major foreign grain producing areas, new U.S. farm policies should generate some expansion of the nation's farm product exports. However, growth of U.S. agricultural exports seems likely to remain well below the sharp upward trend of the 1970s. Several more years of adjustment appear necessary before Eastern Europe, Latin America, and other developing nations fully recover from current debt problems. Oil-exporting nations also are beginning to experience some of these same economic forces, with reduced availability of funds for farm product imports and expected slower economic growth or in some cases negative economic growth in the years ahead. Growth rates for U.S. agricultural exports also will depend on future trends in the value of the U.S. dollar. Recent major changes in U.S. policies, with sharply lower price support levels, and the decline in value of the U.S. dollar should stimulate some growth in volume of U.S. agricultural exports during the next several years. However, a time lag will be involved before export growth rates reflect the full benefit of these actions.

U.S. Government-assisted Export Programs: PL 480 Continued, Export Payment-in-Kind to Be Expanded

In contrast to the 1970s when U.S. government export assistance programs were small, official programs to encourage expanded exports have increased substantially in size in the last few years with the downtrend in U.S. commercial sales. These programs have their origins as far back as the 1920s and in the Agricultural Development and Assistance Act of 1954 (Public Law 480). Originally they were intended to: (1) assist in disposal of surplus U.S. agricultural commodities, (2) help countries lacking foreign exchange to purchase U.S. agricultural products, and (3) facilitate U.S. foreign aid efforts.[27] In the last 15 years, similar programs have been developed by Western Europe and Japan. And since the beginning of this decade, emphasis in U.S. programs has increasingly shifted toward: (1) assisting nations that are unable to obtain commercial financing, (2) providing more attractive financing arrangements than are commercially available in order to compete with financing terms and/or price advantages offered by other exporting nations, and (3) reducing world hunger.

Types of Assistance Programs

The U.S. has three main types of concessional export programs for agricultural products: Title I and Title II of PL 480 and AID programs. The PL 480 Title I Program provides long-term, low-interest credit with repayment terms of up to 40 years and a grace period of up to 10 years. Repayments are to be made in U.S. dollars or other currencies readily convertible into dollars. U.S. statutes require three-fourths of all food aid exports under Title I to be sent to countries with a per capita Gross National Product (GNP) of $730 or less per year.[28] Prior to fiscal year 1982, the GNP requirement had been $680 per year. Title II of the PL 480 Program involves food donations for export, with about two-thirds normally shipped by voluntary relief agencies. In fiscal year 1982, Title II shipments were supplemented by an additional 27 percent contributed from the World Food Program and 9 percent from government-to-government export programs. Until recently, India was a major recipient of Title II agricultural exports. That nation accounted for slightly over one-fifth of such shipments in fiscal year 1981-82.[29]

The AID (Agency for International Development) Program was begun in 1979 to provide financial grants and loans for agricultural commodity purchases. After its inception, strong emphasis for such financing was first given to Israel and later extended to Egypt and Sudan.[30] Table 18 and Appendix IV, Table 1 show the distribution of U.S. farm product exports under concessional programs by commodities during the past seven years. These programs have been oriented heavily toward soybean oil, wheat, flour, and nonfat dry milk.

Blended Credit Program Dropped; U.S. Government Loan Guarantees Continued[31]

During the past five fiscal years, the U.S. administration and Congress have given sharply increased emphasis to U.S. government loan guarantees and other non-PL 480 export assistance programs. By the 1983-84 fiscal year, about one-eighth of the total dollar value of U.S. agricultural exports was accounted for by combined shipments under such programs and PL 480 programs, in an effort to halt the downward trend of U.S. agricultural exports. Commodity Credit Corporation (CCC) loan guarantees (GSM 101 and 102 funds) are a cornerstone of the non-PL 480 programs. These funds are used to assist exporting firms in making sales to foreign buyers who have difficulty obtaining commercial credit. With CCC loan guarantees, private lending institutions provide short-term or intermediate-term credit for purchases of U.S. farm products. The CCC, a U.S. government agency, guarantees repayment of the loans and a sizable part of the interest. U.S. Department of Agriculture officials indicate the repayment history on CCC-guaranteed loans generally has been good. However, one exception is Poland. CCC has found it necessary to make some payments on loans to that nation in the past few years because of its severe financial problems. With serious debt problems in many developing nations, some analysts express concern that future repayment rates may be less favorable than in the past.

One important example of the use of CCC-credit guarantees is Mexico. With its severe 1982-83 financial crisis, over $1 billion in CCC credit guarantees were allocated to that nation in fiscal 1982-83 along with sizable allocations the next two years to maintain continued imports of U.S. farm products. Mexico used this financial assistance to purchase U.S. corn, grain sorghum, wheat, soybeans, and other farm products.

In 1982-83, to further encourage U.S. farm product exports, the U.S. government for a short period of time used a Blended Credit Program. The program was continued through the middle of the 1984-85 fiscal year before being at least temporarily discontinued. It involved a one-tenth blend of interest-free government loans (GSM 5 funds) and nine-tenths CCC credit guarantees (GSM 102 funds) that normally cover up to 98 percent of the principal and up to 8 percentage points of interest. Major commodity emphasis in the Blended Credit Program was given to wheat, wheat flour, and soybean oil. Special effort was made to ensure that Blended Credit sales were beyond quantities that recipient countries would have purchased without the program. In addition, the program was viewed as a tool for increasing the U.S. share of world food trade and for competing with subsidized sales from the exporters, particularly the European Community. However, full achievement of such objectives requires that competing exporters not respond with their own expanded export incentive programs and that they take action to reduce production and/or store surplus supplies of agricultural products. These response conditions were not met in the Blended Credit Program.

Reason for Halting Blended Credit Program

United States laws previously required that 50 percent of all U.S. concessional exports of farm products be shipped in American flag ships. Such legislation originally was enacted to help ensure that the U.S. would maintain a viable merchant marine fleet for national defense purposes. In recent years, freight rates for U.S. vessels have been $.40 to $.80 or more per bushel above comparable rates for foreign vessels, with the exact differential depending on vessel size, shipping route, destination, and other variables. The percentage U.S. flag ship requirement is known as cargo preference and was applied to PL 480 shipments, but not to the Blended Credit Program until the spring of 1985. Prior to that time, the U.S. Department of Agriculture had considered the Blended Credit Program a commercial sales program rather than a concessional export program. However, a court decision in March 1985 determined that the program involved concessional sales and therefore must meet cargo preference requirements. The added cost of shipping in U.S. vessels would have in most cases more than offset any advantages to the foreign buyer from lower financing costs, and would make the program unattractive. As a result, the administration halted sales under the Blended Credit Program.

In the Food Security Act of 1985, the U.S. Congress modified the cargo preference requirement by increasing the required percentages of commodities to be shipped in U.S. flag ships to 75 percent. The increase will occur over a three-year period with a 10 percentage point increase in 1986 and 1987, and a 5 percentage point increase in 1988. In addition, shipments of grain under export Payment-in-Kind and Blended Credit programs were specifically excluded from the cargo preference requirements.[32] These changes and a Congressional requirement that the U.S. government use at least $1 billion in government-owned commodities for Export Payment-in-Kind programs during the next three years point in the direction of significantly increased government assistance for U.S. agricultural exports in the next few years.[33]

Figure 33 shows the increased importance of government-assisted U.S. export programs since the late 1970s and their increased role in total U.S. farm product exports. Prior to the late 1970s, these programs accounted for only a small fraction of all U.S. agricultural exports. Increased emphasis on government-assisted exports began just before the start of this decade, as developing nation debt problems began to emerge. With reduced U.S. farm product exports since 1980-81, the U.S. Congress and administration have increased funding for agricultural export assistance, and current political pressures in the U.S. likely will result in increased funding for related programs in the next few years.

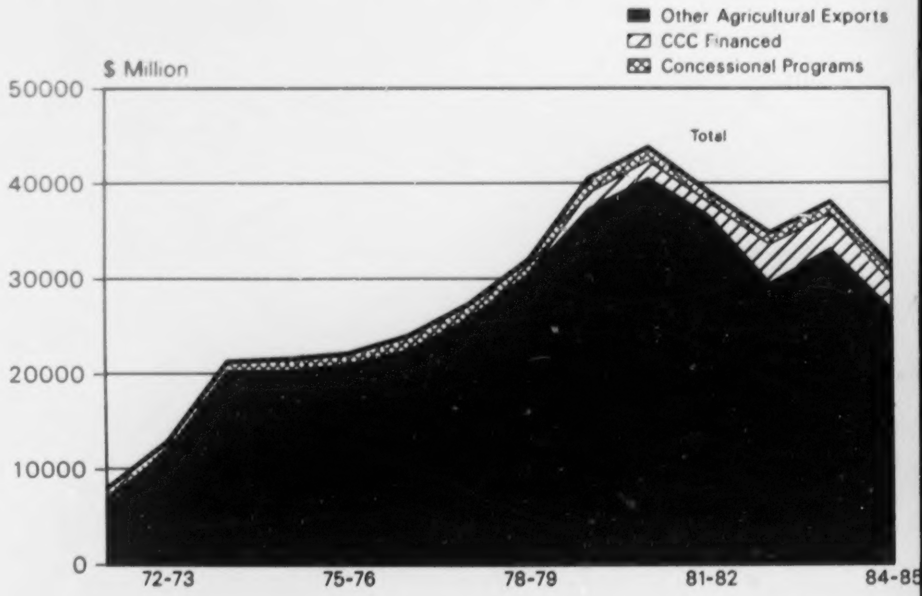
Figure 34 shows the composition of CCC Credit Guarantee programs by major destinations and products in fiscal year 1984-85. Major destinations under the CCC Credit Guarantee programs were Latin America, South Korea, the Middle East, and Western Europe, in that order. Wheat, feed grains, oilseeds, and oilseed products were major commodities involved. Blended Credit programs were targeted heavily toward Africa and the Middle East, with wheat and wheat flour representing the major commodities exported under these programs.

Table 18. U.S. Concessional Government Agricultural Exports as Percent of Total Exports by Major Commodities, Fiscal Years 1977 and 1979 through 1985.

Commodity Products	1977	1979	1981	1982	1983	1984	1985
Wheat and Flour	17.5	13.0	7.6	7.4	10.6	8.6	14.9
Corn	2.5	3.7	2.0	1.4	2.3	2.4	2.0
Soybean Oil	22.0	17.3	38.8	27.7	29.3	27.8	39.6
Cotton (exc. Linters)	1.2	1.0	0.4	0.4	0.6	0.5	0.5
Milk, nonfat dry	99.8	83.4	88.4	27.3	8.7	18.8	72.0
Others	4.2	2.6	2.0	1.2	0.8	1.4	2.9

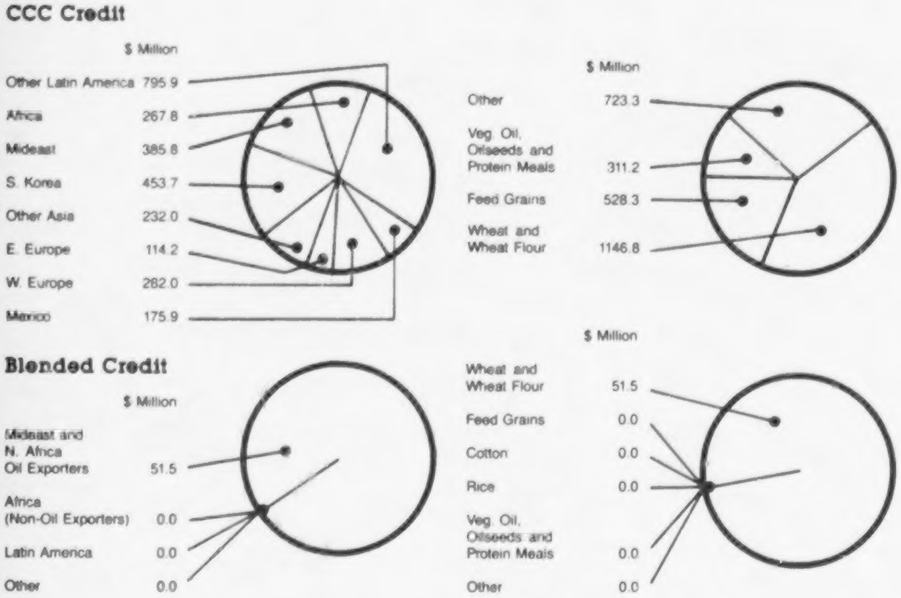
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* January-February 1986 and various other issues.

Figure 33. Dollar Value of U.S. Agricultural Exports Under Government Assisted Programs and Other Sales 1971-85 Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues; U.S. Department of Agriculture, Foreign Agricultural Service *Summary of Exports*, GSM 101, GSM 102, GSM 201, GSM 301, unpublished material (Washington, D.C.), December 1982; and *Notice To Recipients: Summary of FY 83, FY 84, and FY 85 Export Values and Quantities for GSM 102 and Blended Credit* unpublished material (Washington, D.C.), January 1985.

Figure 34. Distribution of Commodity Credit Corporation Export Credit Guarantees and Blended Credit Export Programs by Destinations and Products, Fiscal Year 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service *Summary of Exports*, GSM 101, GSM 102, GSM 201, GSM 301, unpublished material (Washington, D.C.) December 1982; and *Notice to Recipients; Summary of FY 83, FY 84, and FY 85 Export Values and Quantities for GSM 102 and Blended Credit* unpublished material (Washington, D.C.), January 1985.

U.S. Agricultural Trade Trends by Commodity Groups

As shown in Figure 35 and Table 19, the total dollar value of U.S. agricultural exports declined sharply in the 1984-85 fiscal year. Total agricultural exports were valued at $31.2 billion, 18 percent below the previous year, and sharply below the 1980-81 level. Declines were especially pronounced in 1984-85 in grains and cotton with crop export values being reduced both by sharply lower prices and reduced export volumes.

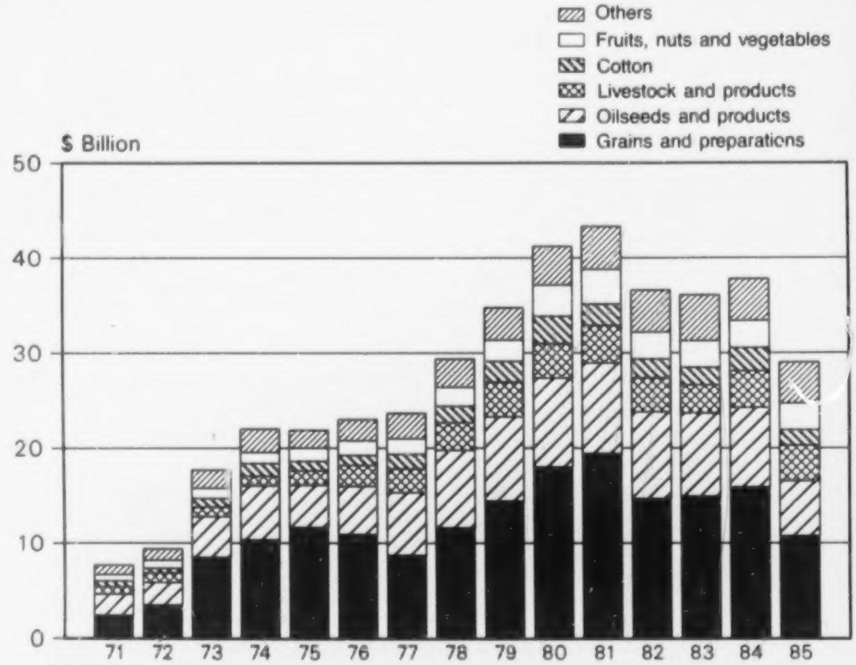
Composition of U.S. Agricultural Exports

Grain and oilseed exports, as indicated in Figure 35, accounted for a large part of the growth of agricultural exports from 1970 through 1981. These same products also have accounted for much of the drop in value of exports since 1981. Livestock and poultry exports make up about one-tenth of all U.S. agricultural exports in dollar value. The value of these exports as a group in 1984-85 was nearly the same as four years earlier, while cotton exports were down substantially. The value of fruit, nut, and vegetable exports dropped sharply in the past four years, with the value lower than in 1980-81. Grain and grain product exports during the same period declined by 46 percent. Grains, feeds, oilseeds, and oilseed products together had accounted for approximately two-thirds of U.S. agricultural exports in recent years, but their share dropped to 57 percent in 1984-85.

U.S. Agricultural Imports

In previous issues of this report, it has been noted that sustained trading relationships require a two-way exchange between trading partners. If the United States is to export products and services to other countries, it must also be willing to import from those countries in order to maintain a lasting trading relationship. In other words, products Americans buy from other countries generate earnings that those countries can use to purchase U.S. exports. In this process, trading partners usually export products that can be produced more efficiently at home. These same trading partners also tend to import products that can be produced more economically by their trading partners. Through this process, participants on both sides of the trading transaction can increase their standards of living over levels that would otherwise exist and can carry on a substantial trading relationship over an extended period of time.[34] Because of this principle of comparative advantage, the U.S. imports a sizable volume of certain agricultural commodities.

Figure 35. Value of U.S. Agricultural Exports by Commodity, 1971-85 Calendar Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues. Livestock excluding poultry and dairy products.

Table 19. Composition of U.S. Agricultural Exports by Type of Commodity, 1976-77, 1980-81, 1983-84, and 1984-85 in Billions of Dollars.

Commodity Group	October-September Fiscal Years 1976-77	1980-81	1983-84	1984-85	Percentage of 1984-85 Total Exports
Feed grains	5.39	10.40	8.13	6.78	21.7
Oilseeds	4.64	6.98	6.25	4.32	13.9
Oilseed meal	0.97	1.67	1.22	0.85	2.7
Vegetable oils	0.77	1.10	1.13	1.02	3.3
Wheat and wheat products	3.05	8.05	6.78	4.53	14.5
Rice	0.69	1.54	0.90	0.68	2.2
Meat and meat products	0.61	0.99	0.93	0.91	2.9
Hides and skins	0.80	1.00	1.32	1.32	4.3
Dairy products	0.17	0.24	0.39	0.41	1.3
Poultry and poultry products	0.30	0.77	0.41	0.39	1.3
Other animals and animal products	0.77	1.11	1.16	1.04	3.3
Cotton	1.54	2.23	2.39	1.95	6.2
Fruits, vegetables, and nuts	2.45	3.56	2.82	2.83	9.1
Tobacco	1.08	1.34	1.43	1.59	5.1
Others	0.78	1.63	2.75	2.57	8.3
Total	24.01	42.61	38.03	31.19	100.1

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1985; November-December 1983; November-December 1982, and November 1977.

Table 20 shows the composition of U.S. agricultural imports in 1984-85 and comparisons with recent years. About one-third of all U.S. agricultural imports is represented by products not produced commercially in the United States or produced only in very limited quantities because of climatic limitations. These products are classified as complementary imports because they do not compete directly with domestic production. Included in this category are coffee, tea, rubber, cocoa, drugs, bananas, and other tropical fruits. The largest single commodity in dollar value in this group, coffee, accounts for approximately one-half of all complementary imports. Total U.S. imports of complementary agricultural products in fiscal 1984-85 rose 2 percent above the previous year, along with a 6 percent increase in imports of supplementary agricultural products.

Supplementary imports are those products that compete with domestic production. As shown in Table 20, the three largest supplementary import groups are: (1) fruits, nuts, vegetables, and associated products; (2) meat and meat products; and (3) alcoholic beverages. Despite a restrictive U.S. sugar import policy, U.S. sugar and sugar product imports are the fourth largest supplementary import group. Meat and meat product imports in 1984-85 accounted for about 11 percent of the dollar value of all U.S. agricultural imports. Alcoholic beverages and tobacco imports together accounted for approximately 11 percent of the total, along with 13 percent for fruits, nuts, vegetables, and preparations. While the United States is a large net exporter of oilseeds, oilseed products, grains, and feeds, it also imports small quantities of these products. With the exception of palm oil and coconut oil, these imports usually originate in Canada and represent marketings from elevators, processors, and farmers located near the U.S. border. In the same way, modest quantities of U.S. products sometimes flow across the U.S. border into Canada, although the strong U.S. dollar in the past three years has discouraged this and, instead, has encouraged increased U.S. imports of Canadian products. U.S. imports of palm oil originate largely in Malaysia, with the volume varying, depending on the price advantage relative to soybean oil. And U.S. coconut oil imports typically come from the Philippines.

Figure 36 shows the trend in U.S. imports of agricultural products by major commodity groups since the early 1970s. The value of sugar imports has dropped considerably since the late 1970s because of lower prices, and technological developments in corn processing that have brought sharply increased use of high-fructose corn sweeteners in U.S. soft drinks and processed foods as a substitute for sugar. Trends in imports of U.S. meat and exports of livestock products are shown in Figures 37 and 38.

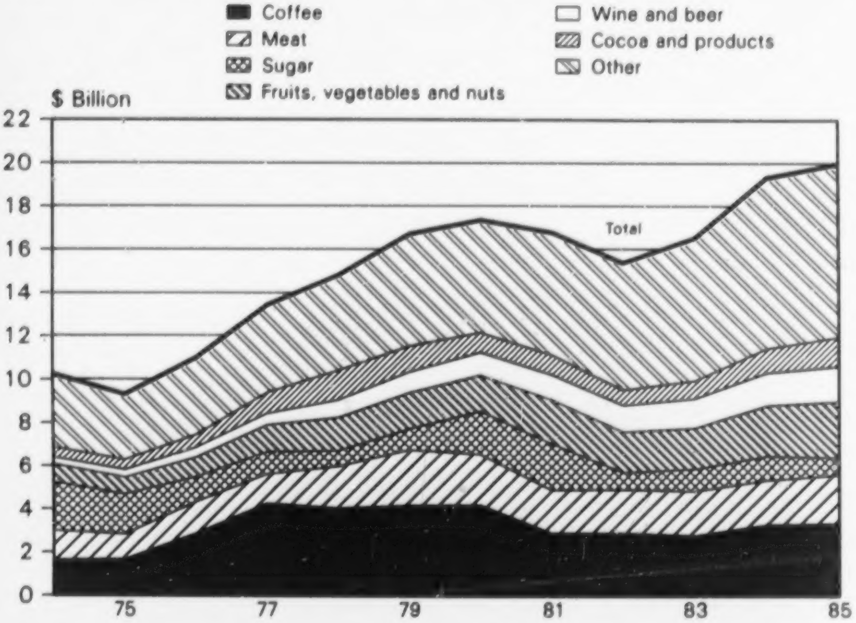
Table 20. Value of U.S. Agricultural Imports in 1975-76, 1982-83, 1983-84, and 1984-85 October-September Fiscal Years by Commodity Groups in Billions of Dollars.

Product	1975-76	1982-83	1983-84	1984-85	Percent Change 1975-76 to 1984-85
Complementary Imports:					
Cocoa and chocolate	0.60	0.83	1.06	1.29	+115
Coffee	2.39	2.83	3.30	3.24	+36
Rubber	0.47	0.58	0.85	0.68	+45
Tea	0.09	0.13	0.19	0.18	+100
Bananas and plantains	0.26	0.59	0.67	0.75	+188
Drugs	0.11	0.16	0.20	0.20	+82
Others	0.28	0.35	0.41	0.43	+54
Total complementary imports	4.21	5.47	6.68	6.78	+61
Supplementary Imports:					
Dairy products	0.26	0.61	0.76	0.76	+192
Hides and skins	0.20	0.13	0.22	0.24	+20
Meat and meat products, excluding poultry	1.44	2.05	1.93	2.21	+53
Poultry and poultry products, excluding eggs	0.09	0.08	0.09	0.08	−11
Other animal products and animals	0.33	0.64	0.92	0.86	+161
Total animals and animal products	2.31	3.51	3.92	4.15	+80
Fruits, nuts, vegetables, and products	0.88	2.32	2.28	2.49	+183
Sugar and products	1.35	1.13	1.46	1.28	−5
Alcoholic beverages	0.43	1.32	1.51	1.55	+260
Oilseeds and products	0.54	0.01	0.80	0.78	+44
Grains, grain products, and feed	0.23	0.11	0.53	0.60	+161
Tobacco	0.28	0.73	0.56	0.56	+100
Others	0.30	1.67	1.17	1.55	+417
Total supplementary imports	6.31	10.80	12.24	12.96	+105
Total agricultural imports[a]	10.51	16.27	18.92	19.74	+88

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade the United States*, November-December 1985, November-December 1983; November-December 1982; November 1977.

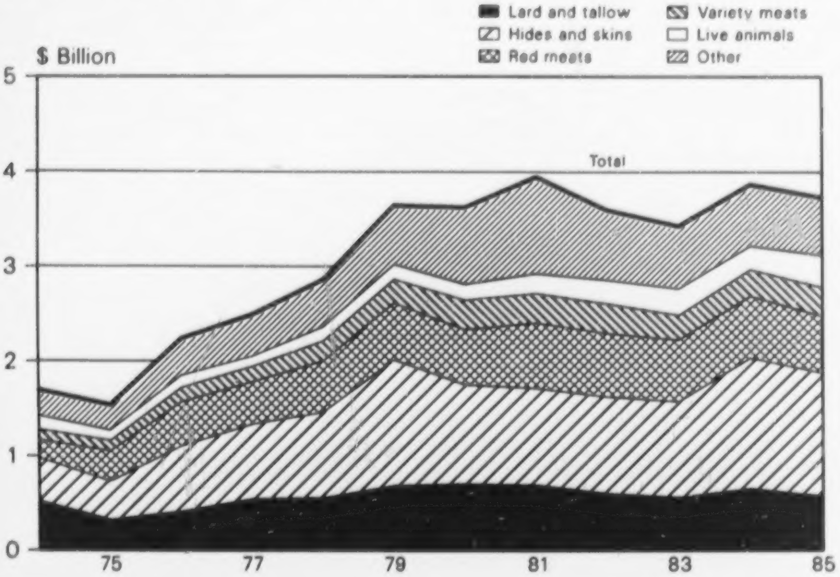
[a] Totals may not add due to rounding.

Figure 36. Value of U.S. Agricultural Imports by Commodity, 1974-85 Calendar Years.



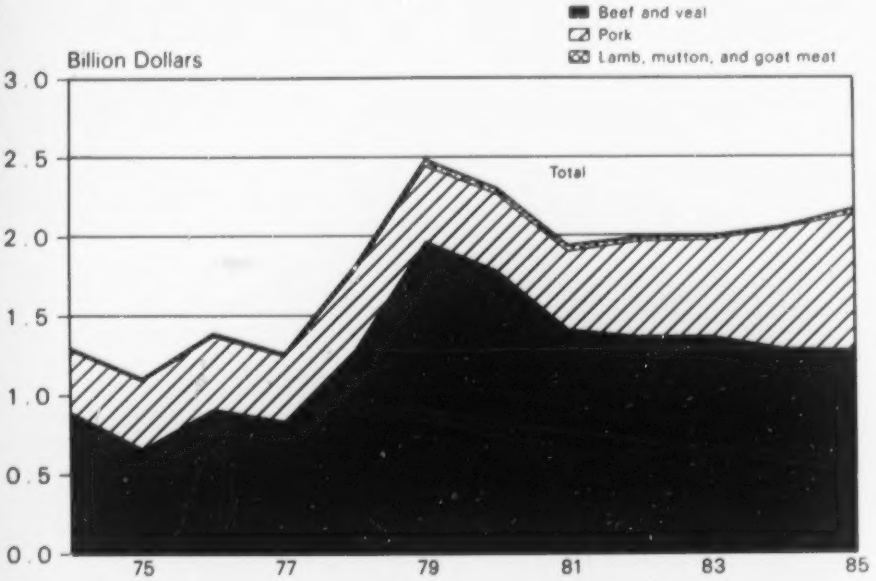
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues. Note: fruits, vegetables, and nuts include bananas. Other includes dairy products, oilseeds and products, rubber, and other imports.

Figure 37. Value of U.S. Livestock Product Exports by Type of Product, 1974-85 Calendar Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues. Poultry exports are included in the "other" category.

Figure 38. Value of U.S. Red Meat Imports by Type of Product, 1974-85 Calendar Years.



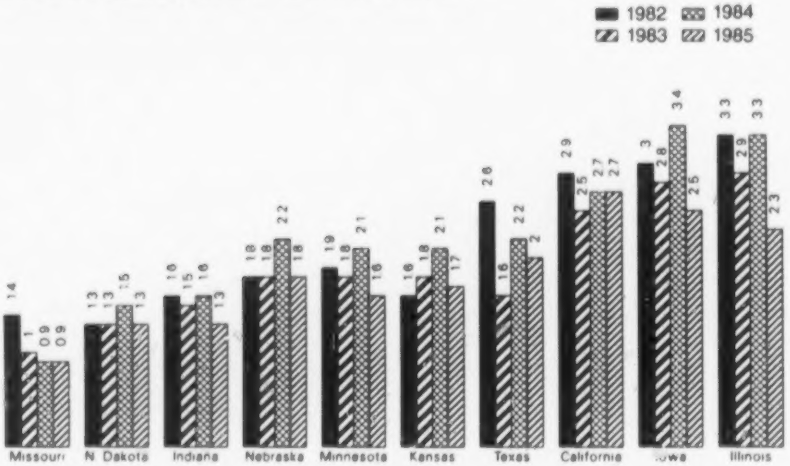
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues.

U.S. Agricultural Exports by Leading States and Economic Groupings by Destinations

The value of U.S. farm product exports by 10 leading states for the past three fiscal years is shown in Figure 39. The top four exporting states are California, Iowa, Illinois, and Texas, in that order, with other top-ranking exporting states located in major grain-producing areas of the Midwest. Illinois and Iowa are large exporters of coarse grains, soybeans, soybean products, and livestock. California and Texas reflect greater diversity in exports including fruits, vegetables, cotton, and nuts, as well as grain and livestock products. The relative ranking of the top 10 agricultural exporting states has changed little in the past five years, but occasionally shifts slightly from year to year depending on the size of crops in individual states. In 1984 Ohio replaced Missouri in 10th place, partly because of severe drought the previous year that adversely affected Missouri crop production.

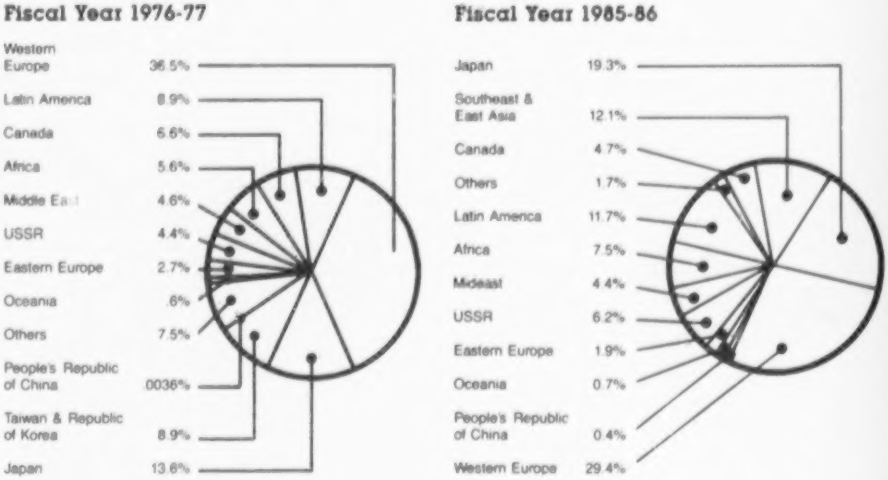
Figures 40 through 42 show total U.S. agricultural exports, as well as corn and wheat exports by geographic destinations now and in the early 1970s. Western Europe has declined sharply in importance as a market for these products in recent years, while Japan and less developed countries have grown in importance as a market for U.S. corn. For combined exports of all U.S. farm products, major growth areas since the early 1970s include Latin America, Southeast and East Asia, and Japan, along with modest growth in exports to Africa. U.S. agricultural exports to Eastern Europe declined modestly from 1976-77 to 1985-86.

Figure 39. Value of U.S. Agricultural Exports by Selected States in Billions of Dollars, Fiscal Years 1981-82 through 1984-85.



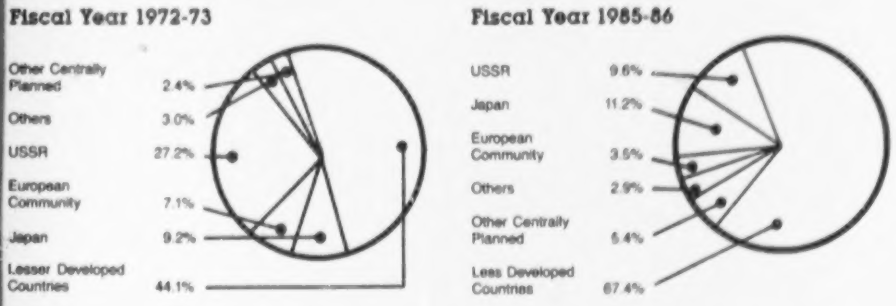
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), March-April 1986 and various other issues and personal communications with officials of U.S. Department of Agriculture, Economic Research Service.

Figure 40. U.S. Agricultural Export Percentage Shares to Selected Destinations, 1976-77 and Projected 1985-86 Fiscal Years.



Source: Personal communications with officials of U.S. Department of Agriculture, Economic Research Service.

Figure 41. U.S. Wheat Export Percentage Shares to Selected Destinations, October-September 1972-73 and 1984-85.

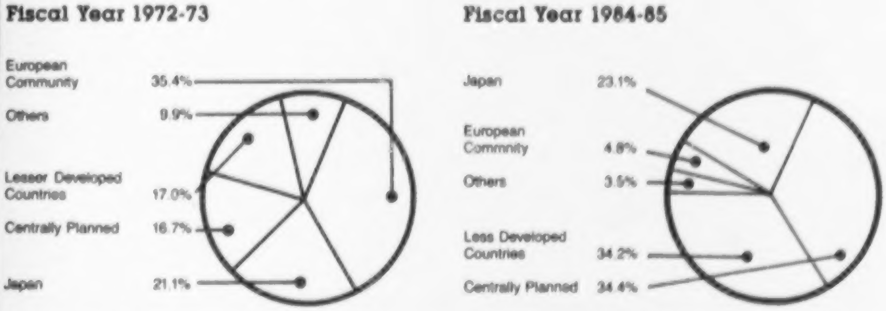


Fiscal Year 1972-73

Fiscal Year 1985-86

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 37-82, December 8, 1982 and Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues. Lesser developed countries include rapidly and moderately developing nations (excluding Greece) and other developing nations.

Figure 42. U.S. Corn Export Percentage Shares to Selected Destinations, October-September 1972-73 and 1984-85.



Fiscal Year 1972-73

Fiscal Year 1984-85

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 37-82, December 1982 and Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues. Lesser developed countries include rapidly and moderately developing nations (excluding Greece) and other developing nations.

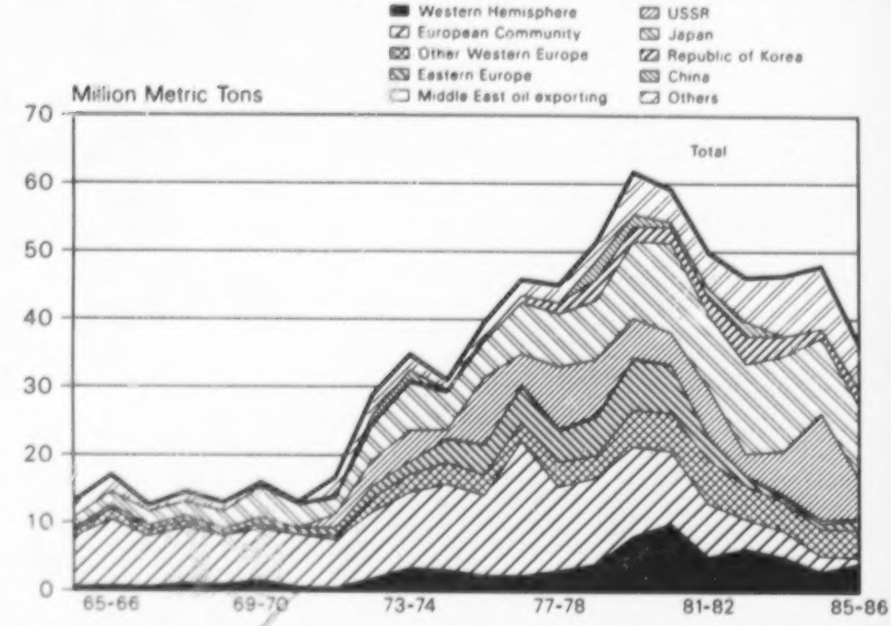
Trends in U.S. Corn and Coarse Grain Exports by Destination

Figures 43 and 44 show a continued dramatic change in the level and destination of U.S. corn and coarse grain exports since the late 1970s. During most of the past two decades, the industrial economies of Western Europe and Japan represented the largest foreign outlets for these U.S. grains. Since 1979-80, however, the once large EC market for U.S. corn has dropped sharply in size along with a slight decline in exports to other West European nations. Even the traditionally stable Japanese and Republic of Korea markets also have declined slightly in size as other competitors have taken steps to export to these nations. China, after being a market outlet for U.S. corn from 1975-76 through 1982-83, dropped its purchases in U.S. corn to zero in the past three years and in fact has become a corn exporter. Chinese exports have been an important factor behind recent declining U.S. corn and coarse grain exports to the Republic of Korea and Japan.

Partially but not completely offsetting these trends, Latin America has increased in importance as a market destination for U.S. corn, along with modest growth in exports to Eastern Europe. The most dramatic change in U.S. corn and coarse grain exports, however, was the extremely sharp decrease in USSR purchases in 1985-86 with imports of American corn by that nation dropping to less than half the previous year's record. The Soviet Union accounted for about one-third of all U.S. corn exports in the 1984-85 marketing year ending September 30, 1985 and one-sixth in 1985-86. The sudden upsurge in Soviet purchases of U.S. corn in 1984-85 reflected that nation's serious 1984 crop problems due to widespread drought, along with record livestock inventories early in the season. The decline in its 1985-86 imports reflected substantially improved crops in 1985.

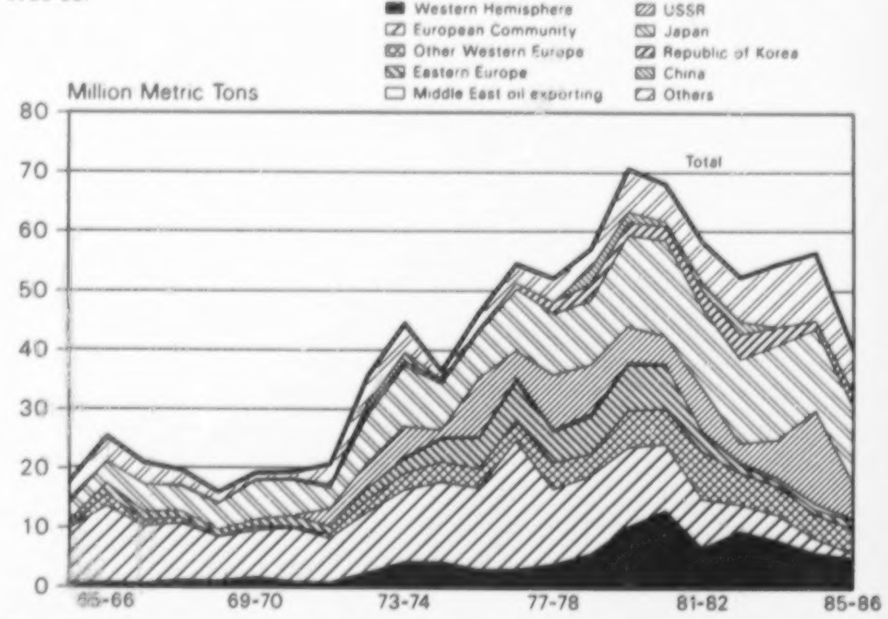
Early and highly tentative indications point to modestly larger U.S. corn and coarse grain exports in 1986-87, although the exact level of shipments will be influenced by the success of the U.S. Export Enhancement programs and reduced U.S. government price support levels, as well as the size of the 1986 USSR grain and forage harvests. Several developments, including changing U.S. farm programs and stability or modest additional weakness in the American dollar, appear to be setting the stage for additional modest growth in U.S. corn and coarse grain exports in the late 1980s and

Figure 43. U.S. Corn Exports by Destination, October-September 1964-65 to 1985-86.



Note: 1985-86 exports are projected using the October 1985-March 1986 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

Figure 44. U.S. Coarse Grain Exports by Destination, October-September 1964-65 to 1985-86.



Note: 1985-86 exports are projected using the October 1985-March 1986 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

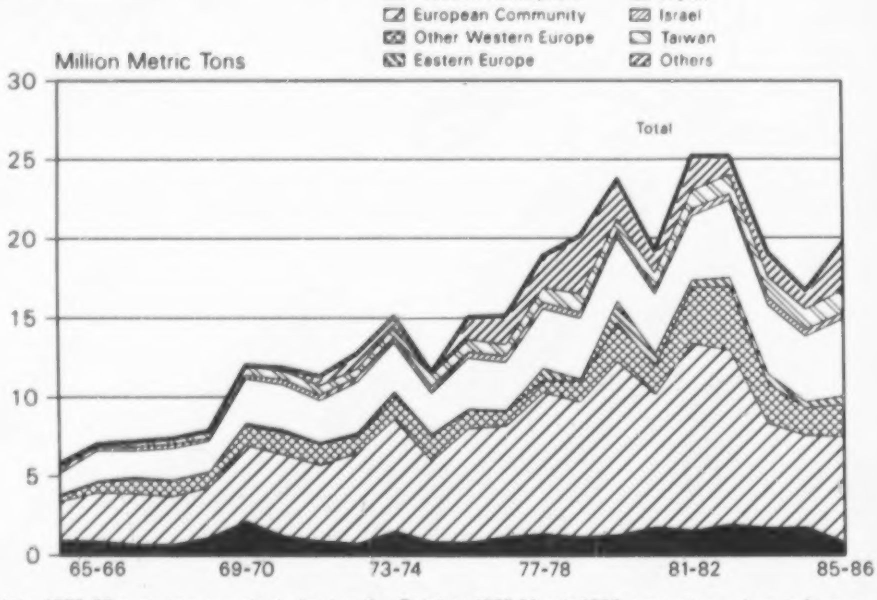
early 1990s. However, global debt problems, strong foreign competition, and slower economic growth appear likely to hold export growth rates during that period well below those of the 1970s.

Trends in U.S. Soybean and Soybean Product Exports by Destination

For more than two decades, the industrial economies of Western Europe and Japan have been the major foreign outlets for U.S. soybeans and soybean meal, with soybean meal being an important input for livestock and poultry production (see Figures 45 and 46). U.S. soybean oil exports, on the other hand, are shipped primarily to developing nations where they are used for direct human consumption as cooking oils (see Figure 47). Until 1982-83, U.S. soybean and soybean meal exports exhibited a strong upward trend driven by growing consumer demand for livestock and poultry products and limited growth of competing protein meals.

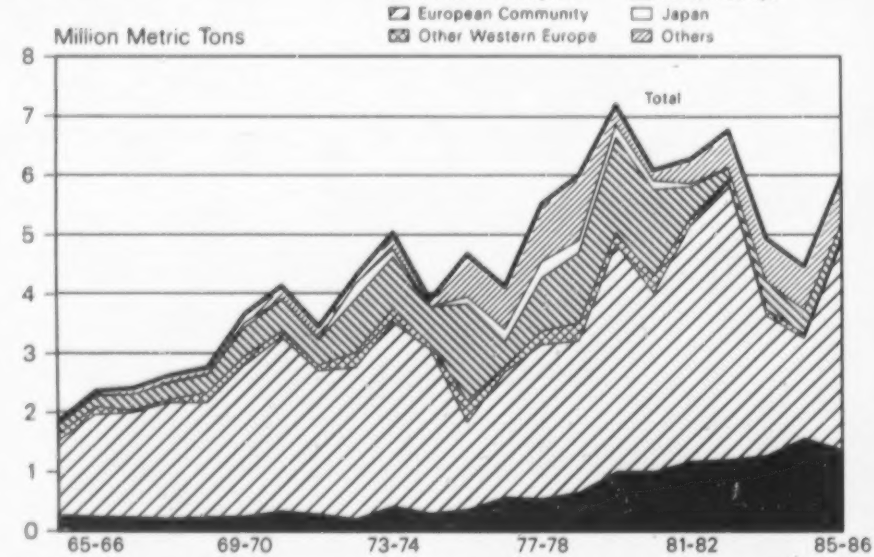
Growth in foreign demand for U.S. soybeans and meal during the past two decades was greatest in the European Community, which until recently has accounted for approximately two-thirds of all U.S. soybean meal exports and approximately half of its soybean exports. Growth in this market during the 1970s was encouraged by rising consumer incomes, high domestic EC support prices for grain, a weak U.S. dollar, and an absence of EC import restrictions on soybeans and soybean meal. The EC's Common Agricultural Policy (CAP) maintained internal grain prices well above world levels, and a complex price support mechanism automatically adjusted for changes in the exchange rate of the U.S. dollar, as it affected grain import costs. In contrast, soybean and meal imports entered EC at world price levels, with the weak U.S. dollar further enhancing soybean meal's attractiveness as a feed ingredient. The combination of support prices for coarse grains sharply above the world levels and soybean meal priced at world levels created a soybean meal/corn price ratio in the EC much more favorable for soybean meal feeding than in the U.S. and most other nations. As a result, soybean meal in the EC was fed both as a protein source and as an energy source or grain substitute.[35] In 1983-84, with a sudden, dramatic rise in soybean and soybean meal prices caused by the U.S. drought, the PIK Program and the strong U.S. dollar, the EC computerized feed manufacturing operations reduced the amount of soybean

Figure 45. U.S. Soybean Exports by Destination, October-September 1964-65 to 1985-86.



Note: 1985-86 exports are projected using the October 1985-March 1986 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

Figure 46. U.S. Soybean Meal Exports by Destination, October-September 1964-65 to 1985-86.



Note: 1985-86 exports are projected using the October 1985-March 1986 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues, and *Foreign Agricultural Circular*, Oilseeds and Products (Washington, D.C.), FOP 5-86, May 1986.

meal being used as a grain substitute. Declining U.S. soybean meal exports to EC continued into 1984-85, before turning upward again in the September-August 1985-86 marketing year. U.S. soybean exports to EC followed a similar trend but declined less drastically in 1984-85.

Other contributing factors behind the sharply lower EC purchases of U.S. soybeans and meal in 1984-85 included: (1) a sluggish general economy with slower growth in EC incomes than in the 1970s and high unemployment, (2) a dairy surplus reduction program that sharply reduced manufacturing dairy feed sales in 1984-85,[36] (3) sharply expanded EC wheat feeding, and (4) large imports of U.S. corn gluten feed and meal as a substitute for soybean meal. Wheat has a higher protein content than corn, which it has replaced in livestock and poultry rations, thus reducing soybean meal requirements. Corn gluten feed and meal are byproducts of the expanding U.S. corn sweeteners and alcohol fuels industry, with around 3.5 million metric tons of these products being exported to EC in the last three years.[37] U.S. soybean meal exports to EC in 1984-85 totaled 1.7 million metric tons, down from about 3.9 million tons in 1979-80.

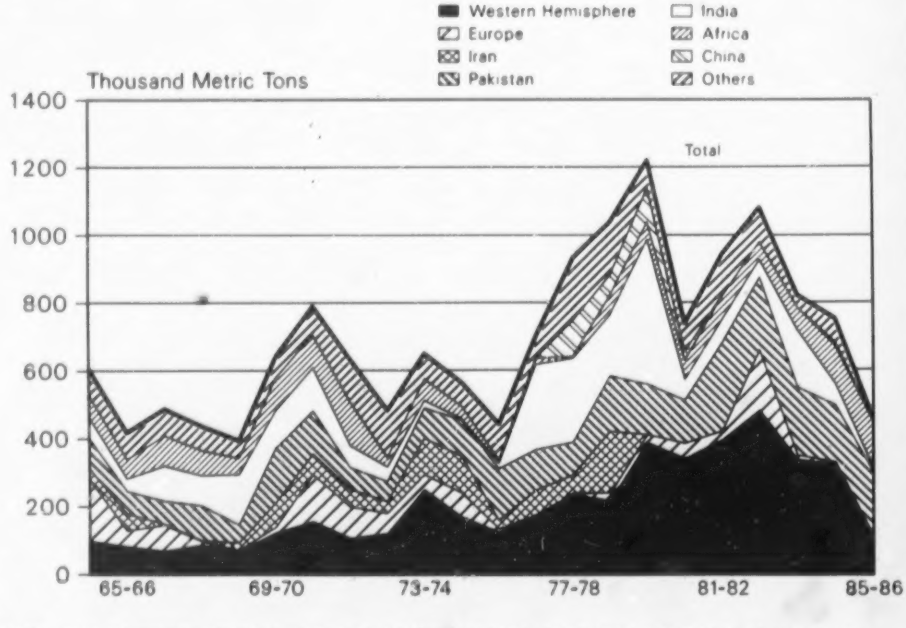
Rising U.S. soybean and soybean meal exports in 1985-86 reflected slightly accelerated economic growth in a number of foreign countries. Other factors contributing to increased U.S. exports of these products included some improvement in economic conditions in the West European livestock sector, a sharply decreased March-May 1986 soybean harvest in Brazil because of adverse weather and the weaker U.S. dollar.

Figures 45 and 46 indicate U.S. soybean and soybean meal exports briefly experienced a sharp decline in the mid-1970s. The decline at that time was triggered by a weather-reduced U.S. soybean crop in 1974, as well as a temporary world business recession. Reduced U.S. supplies generated sharply higher prices, which brought a rationing of usage in the EC as soybean meal prices increased sharply in relation to coarse grains. Utilization was much less affected in other countries where the coarse grain/soybean meal price ratio was not artificially influenced by government policies. After soybean and meal prices declined to more normal levels, U.S. exports to EC fully recovered within a three-year time period.

U.S. soybean and soybean meal exports in the years immediately ahead will depend on the exchange rate of the U.S. dollar, as well as EC livestock and dairy policies and world economic growth. The strengthening dollar in the early 1980s created a price shock in EC meal markets similar to that from a short U.S. soybean crop. With a moderate weakening of the U.S. dollar in the next few years, some growth in the U.S. bean and meal exports to EC seems likely,[38] along with potential growth in exports to Eastern Europe and USSR. However, growth rates appear likely to remain well below those of the 1970s because of slower growth in the world economy, continued debt problems in developing nations, and increased EC wheat feeding stemming from technological improvements in production of that grain.

In contrast to U.S. soybean meal and soybean exports, major foreign markets for soybean oil consist primarily of developing nations in Asia, Africa, and Latin America. As Figure 47 indicates, U.S. soybean oil exports have been highly variable from year to year for more than two decades. Short-term fluctuations in exports are due largely to changes in production of major competing vegetable oils, animal fats, marine oils, and changes in U.S. soybean oil supplies and prices. The export demand for U.S. soybean oil is highly price inelastic. In other words, large changes in prices are needed to bring significant increases or decreases in exports, provided all other market influences remain unchanged. For example, U.S. soybean oil exports dropped sharply in 1983-84, not because of reduced demand, but primarily due to drought-reduced U.S. soybean supplies, limited availability of U.S. soybean oil for export, a sharp rise in soybean oil prices, and the rationing effect on exports resulting from the higher prices. To bring about the required sharp decline in U.S. exports, soybean oil prices in late 1983 and early 1984 rose more than 50 percent above the average level of recent years. The strong dollar and debt burdens of developing nations were other factors tending to reduce 1983-84 soybean oil exports. However, with a high percentage of U.S. soybean oil exports being shipped under

Figure 47. U.S. Soybean Oil Exports by Destination, October-September 1964-65 to 1985-86.



Note: 1985-86 exports are projected using the October 1985-March 1986 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseed and Products* (Washington, D.C.), various issues.

government financing programs, these factors appear to have been less significant than in grain and soybean exports.

Exports of U.S. soybean oil in the first half of the 1985-86 fiscal year fell sharply below the previous season at an annual rate less than half the peak level of 1981-82. Exports to India dropped to zero as a result of increased competition from domestic oilseeds and Malaysian palm oil. U.S. soybean oil exports to Pakistan and Africa in the first half of 1985-86 rose slightly above a year earlier, but fell far short of offsetting declines to other foreign destinations. The long-term upward trend in Malaysian palm oil production was temporarily interrupted in late 1983 and the first few months of 1984 as a result of dry weather and stress on trees from the introduction of a weevil to aid in pollination. However, palm oil production resumed its long-term upward trend from mid-1984 through mid-1986.

World fat and oil supplies also were tightened in 1983-84 by an unusually small 1983 U.S. cottonseed crop (down 35 percent from 1982 and down 51 percent from 1981), a resulting decline in U.S. cottonseed oil supplies, and by cyclically reduced olive oil production in Mediterranean countries. These developments brought a sizable decline in visible and invisible (unreported) world fat and oil inventories by late 1984. With inventories at minimal levels, global soybean oil trade patterns in the 1984-85 trade year reflected efforts by the world vegetable oil trade to replenish stocks to a more normal level. Stocks-rebuilding efforts helped to maintain 1984-85 soybean oil prices well above levels of the late 1970s and early 1980s despite increased U.S. and global oilseed and vegetable oil production.

However, an abrupt change in the global soybean oil situation occurred in 1985-86. With substantially increased U.S. soybean and Malaysian palm oil production, global soybean and vegetable oil stocks are rising sharply in the October-September 1985-86 trade year. Rising stocks have pushed soybean oil prices sharply below year earlier levels and have contributed to depressed world soybean prices. Early indications are that world palm oil and soybean oil supplies will remain relatively large in the year ahead and will continue to restrain soybean oil prices and exports.

In examining prospects for U.S. soybean oil exports in the late 1980s and early 1990s, Figure 47 shows a modest long-term upward trend in exports despite large year-to-year fluctuations. The upward trend reflects an annual population growth of over 2 percent in most developing nations. In addition, per capita fat and oil consumption in these countries is moderately sensitive to changes in per capita incomes. The long-term upward trend of population and incomes in developing countries appears likely to push U.S. soybean oil exports irregularly higher in the years ahead. In contrast, per capita fat and oil consumption in industrialized nations already is large and is expected to increase only slowly. Thus, developing countries are likely to remain the leading export markets for U.S. soybean oil in the years ahead. Since soybean oil competes with a wide range of other fats and oils, large year-to-year fluctuations in U.S. soybean oil exports also are likely to continue in the foreseeable future, due to fluctuations in availability of competing products.

Major products that compete with soybean oil include butter, lard, tallow, sunflowerseed oil, cottonseed oil, rapeseed oil, peanut (groundnut) oil, palm oil, coconut oil, safflower oil, olive oil, and fish oil. In contrast to oilseeds from which many of the competing vegetable oils are produced, soybeans have a relatively low oil content (18 percent) and a relatively high protein meal yield per ton (80 percent). Long-term global demand for soybean meal has grown more rapidly than the demand for soybean oil, partly because of strong dietary shifts toward more meat and poultry consumption, as incomes rise in rapidly and moderately developing economies. This has generated long-term growth in demand for livestock and poultry feed ingredients, and relatively slower growth in global demand for fats and oils. Moreover, soybeans have faced strong competition in the oil sector from high-oil content oilseeds. In the years ahead, indications are that competition from palm oil production and exports will increase significantly and will continue to restrain long-term growth of U.S. soybean oil exports. Tree plantings in major producing regions of Malaysia have been expanded sharply in recent years and may continue to expand through the remainder of this decade. In addition, improved management practices have the potential to increase palm oil production per hectare significantly in the years ahead.[39]

These forces, from the viewpoint of the U.S. soybean industry, suggest a need for continued priority on market development, as well as development of new products from soybean oil. The unusually tight U.S. and world soybean oil supplies of 1983-84 and 1984-85 were a temporary development, although adverse weather conditions in major foreign and U.S. producing regions can be expected to bring short-term reoccurrences of that situation from time to time.

U.S. Wheat Exports by Destination

Figure 48 reveals substantial changes in destinations of U.S. wheat exports since the late 1970s, with the changes becoming even more dramatic in the 1985-86 fiscal year. The three most pronounced changes were an abrupt decline in Chinese purchases of U.S. wheat starting in 1984-85, a sharp drop in exports to USSR in 1985-86, and the rapid growth of Africa as a market for U.S. wheat. In addition, Europe and the Middle East oil exporting nations have reduced their imports of U.S. wheat significantly in recent years. Reduced European imports reflect substantially increased wheat production in that area. While Europe is a net exporter of wheat, much of its crop consists of soft wheat varieties. The U.S. continues to export hard wheat and durum wheat to Western Europe to meet European needs for these wheats. Reduced sales to the Middle East in part reflect increased competition for that market by other wheat exporting nations.

In addition to these trends, U.S. wheat exports to Latin American nations have continued their long-run upward trend, with the Western Hemisphere and Africa together accounting for slightly less than half of all U.S. wheat exports in the 1985-86 fiscal year. Exports to India dropped to zero in 1985-86 as a result of that nation's large domestic production, rising carryover stocks, and its internal pressure to export wheat.

After a temporary upturn in U.S. wheat exports in fiscal 1983-84, exports turned downward in the next two years and in 1985-86 are expected to be only slightly more than half the peak level of 1981-82. Export trends in the next few years will depend somewhat on the success of the U.S. Export Payment-in-Kind (Export PIK) Program announced in mid-1985, as well as continued global population growth and expected modest world economic growth. The Export PIK Program is intended to meet subsidized competition from other wheat exporters, and is expected to be given increased emphasis in 1986-87. Depending on responses of other exporters, it may set the stage for at least slight growth trend in U.S. wheat exports in the late 1980s and early 1990s. However, technological developments in wheat production in India, China, and the European Community appear to be nonreversible and will likely generate strong competition in world wheat export markets in the next few years.

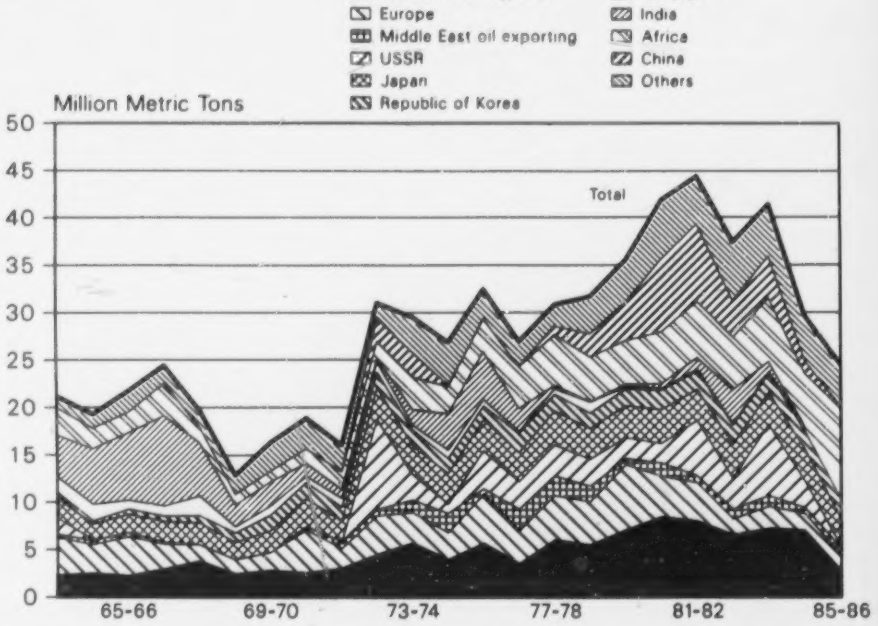
Figure 48 also reveals large year-to-year variations in U.S. wheat exports during the past two decades. This variability is likely to continue in future years and will contribute to significant year-to-year changes in U.S. and world wheat prices. Variability of U.S. exports is related partly to fluctuating production in four important areas: India, China, USSR, and Australia. The first three are populous nations with a history of substantial variations in rainfall and temperatures from one year to the next. Their import requirements are inversely related to the size of domestic production.

Australia has a highly variable climate, is thinly populated, and is a major exporter of wheat. When its weather is favorable for wheat production, the U.S. tends to face increased competition in world wheat markets. In contrast to the U.S., Australia and other wheat exporting nations have not developed a policy of accumulating reserve stocks when production is large. As a result, marketing policies of other exporting nations often leave the U.S. as a residual supplier to world markets. When world supplies are large and world prices are low, the U.S. traditionally has tended to accumulate reserve stocks to support prices. Conversely, when world grain supplies are reduced, U.S. policies have encouraged these reserve stocks to be utilized to fill the supply gap resulting from reduced foreign crops. With the dramatic changes in U.S. price support and reserve policies spelled out in the Food Security Act of 1985, the U.S. role as a residual supplier and holder of reserve stocks could change substantially in the years ahead.

Trends in U.S. Red Meat and Poultry Exports by Destination

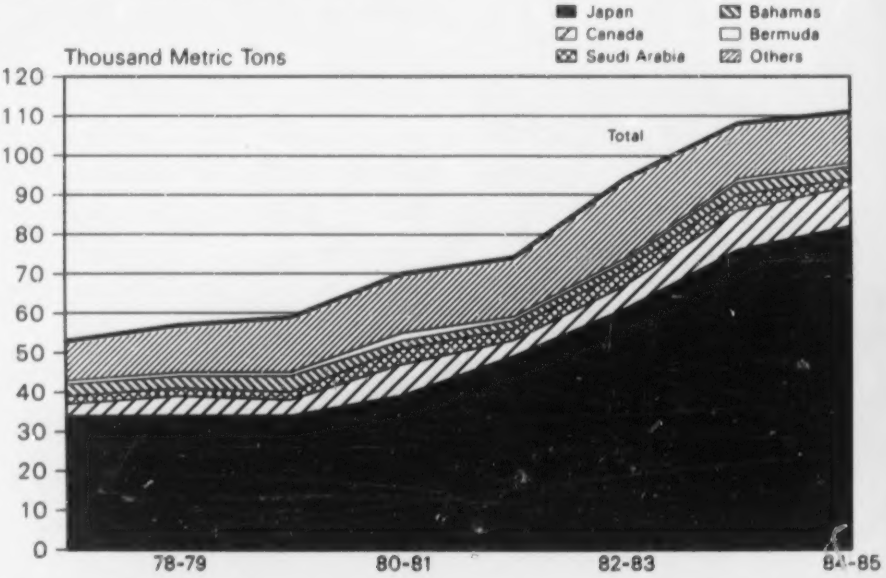
The major export markets for U.S. beef are Japan and Canada (see Figure 49). Japan now accounts for nearly three-fourths of all U.S. beef exports, with an additional 10 percent being exported to Canada in 1984-85. The Japanese market for U.S. beef has grown substantially since the mid-1970s, partly in response to pressures from the U.S. government to ease its import restrictions. On a tonnage basis, total U.S.

Figure 48. U.S. Wheat Exports by Destination, October-September 1963-64 to 1985-86.



Note: 1985-86 exports are projected using the October 1985-March 1986 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

Figure 49. U.S. Beef and Veal Exports by Major Destinations, 1977-78 through 1984-85 October-September Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1985 and various other issues.

beef exports are now about two and three-fourths times as large as in 1976-77, with much of the growth due to the increased Japanese purchases.

Future growth in U.S. beef exports will depend strongly on trade negotiations to ease import barriers in Japan, as well as other nations. While some easing of such restrictions is possible, major changes in foreign nations' beef importing policies should not be expected in the near future. Foreign beef producers are extremely sensitive to changes in import policies that would increase supplies and depress prices for their products. And in Japan, as well as several other beef importing nations, agricultural producers have substantial political influence. Resistance of foreign producers to easing of trade barriers will likely continue as a restraining influence on U.S. beef exports although some further growth appears likely in the years ahead.

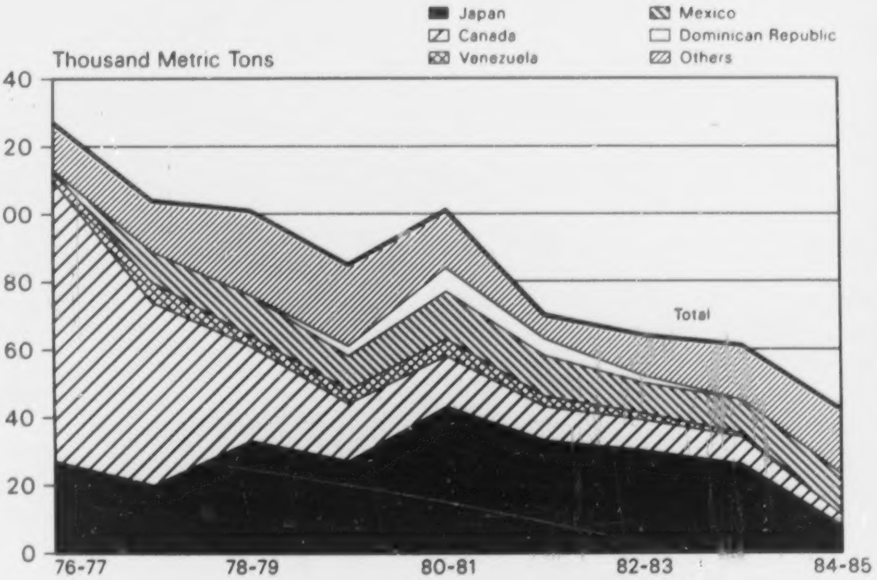
Major destinations for U.S. pork exports include Japan, Mexico, and Canada, as shown in Figure 50. Pork exports from the U.S. to Canada have been a major downtrend from the late 1970s through 1984-85, partly as a result of the strong U.S. dollar, which discourages U.S. exports. With declining exports to both Japan and Canada, U.S. pork exports, on a tonnage basis in 1984-85, were only about one-third as large as in 1975-76. Declining U.S. pork exports also reflect the slow growth of the world economy and strong competition from pork exporting nations in Western and Eastern Europe. With declining exports since the mid-1970s, future U.S. pork export prospects are uncertain. However, a weaker U.S. dollar and slightly accelerated world economic growth may help to stabilize or slightly increase export demand for U.S. pork in the late 1980s.

In contrast to beef and pork exports, edible offals and variety meats have shown a slight upward trend since the mid-1970s (see Figure 51). Major destinations for exports of these products include Western European nations, Japan, Mexico, Canada, and Egypt. In the last seven years, Egypt has emerged as a significant new growth market for U.S. edible offals and variety meats. By 1984-85, it accounted for 11 percent of all U.S. exports of these products and ranked fourth in size of purchases, behind France, Mexico, and Japan.

U.S. poultry meat exports also have been in a sharp downward trend in the last few years, as shown in Figure 52. Exports of these products in fiscal 1983-84 were about 40 percent less than in 1980-81. Declining poultry meat exports reflect subsidized competition from EC and Brazil, as well as adverse effects from the strong U.S. dollar during the 1981-85 period and sluggish world economic growth. Much of the decline was accounted for by reduced exports to Iraq, Egypt, Mexico, Venezuela, and several countries in the Other category in Figure 52. Growth in U.S. poultry meat exports to southeast and eastern Asian markets, including Japan, offset a small part of the decline in exports to other areas during the 1980-81 to 1983-84 period.

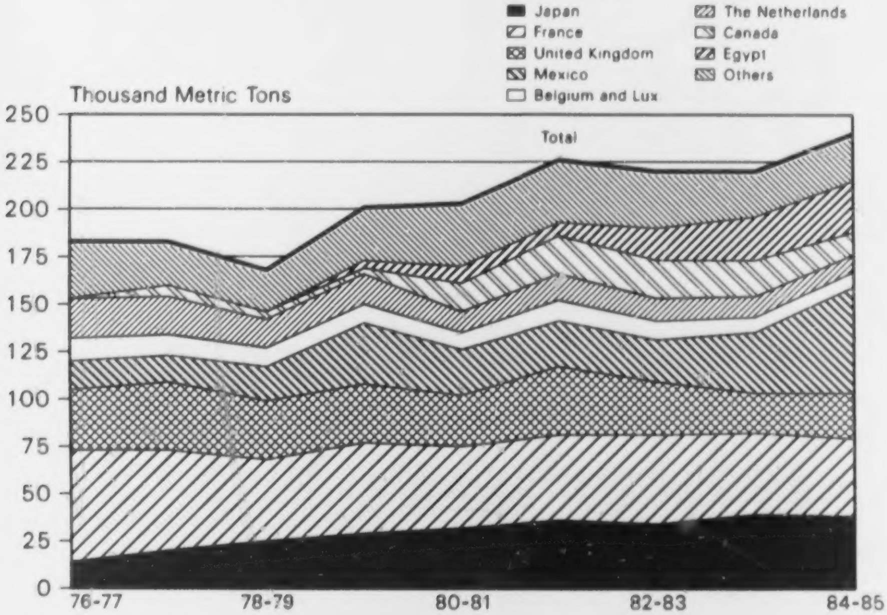
Moderate growth continued in U.S. poultry meat exports to other eastern and southeastern Asian markets in 1984-85, along with some growth in exports to Mexico and Egypt. Increased exports to these nations pushed 1984-85 U.S. poultry meat exports 5 percent above the recent low point of a year earlier. The future of U.S. poultry meat exports will depend heavily on the exchange rate of the U.S. dollar and the strength and timing of changes in world economic growth.

Figure 50. U.S. Pork Exports by Major Destinations, 1976-77 through 1984-85 October-September Fiscal Years.



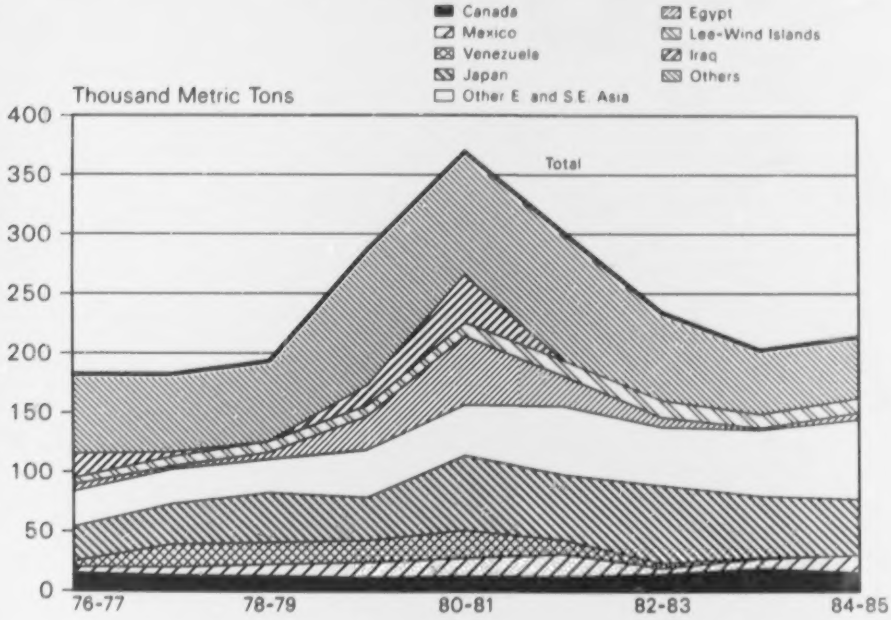
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1985 and various other issues.

Figure 51. U.S. Exports of Edible Offals and Variety Meats by Major Destinations, 1976-77 through 1984-85 October-September Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1985 and various other issues.

Figure 52. U.S. Fresh and Frozen Chicken and Turkey Exports by Major Destinations, 1976-77 through 1984-85 October-September Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1985 and various other issues.

U.S. Price Support Levels Sharply Lowered[40]

After debating nearly six months on ways to improve the U.S. agriculture position in world markets, the U.S. Congress in December 1985 passed complex new farm legislation that will allow sharply lower price support levels on major crops. The legislation, known as the Food Security Act of 1985, continues a twofold approach for income support to U.S. producers of major crops that has been used in recent years. Target prices are a key element of this support system. These are used to determine the amount of deficiency payments paid to farmers if market prices during a specified time period are below target levels. Target prices for major U.S. crops were frozen at 1984-85 levels for the next two years, after which they are scheduled to decline gradually to the end of the decade.

The other major components of the U.S. price support system are the loan rates that date back about half a century when U.S. price support systems originated. Farmers participating in government programs may store their crops beyond harvest and receive a government loan at the designated loan rate per bushel. These loans have a nine-month maturity. At any time during this period, the farmer may repay the loan plus accumulated interest and sell or use the grain. As an alternative that often is used when cash prices are below the loan rate, the farmer may deliver the grain (or other crops) to the government in fulfillment of the loan. In this case, principal and interest on the loan need not be repaid. This process is known as forfeiture of price support loans and is the primary mechanism that increases grain stocks owned by Commodity Credit Corporation (CCC), an agency of the U.S. government. Loan rates vary from county to county across the U.S., due to differences in transportation costs from local producing areas to major export markets. There are thousands of counties in the U.S., each of which has a local office to administer price support programs. For example, Iowa—the leading corn producing state in the U.S.—has 99 counties and loan rates that have varied by approximately $.08 to $.10 per bushel from the highest to the lowest level.

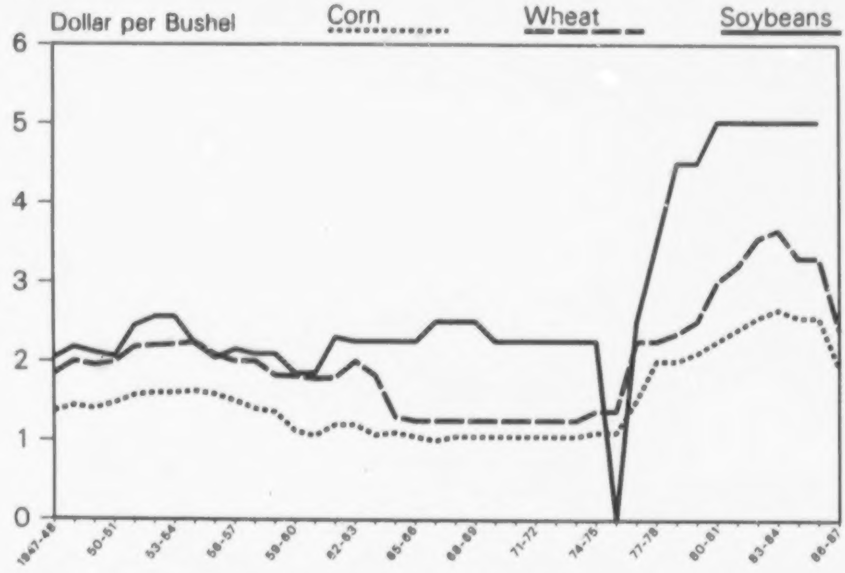
Corn Loan Rates Down

The Food Security Act of 1985 provides much more discretionary authority to the Secretary of Agriculture in setting crop loan rates than in the past. For example, the 1986 crop U.S. average loan rate for corn was set at a statutory minimum level of $2.40 per bushel, down from $2.55 on the 1985 crop. However, the agriculture secretary is required to reduce this by at least 10 percent and can reduce it by as much as 20 percent if the U.S. average price received by farmers in the previous year was not more than 110 percent of the loan rate. This adjustment is required for the 1986 corn loan rate since market prices for the previous year's crop were depressed. The agriculture secretary chose to set the 1986 loan rate at the lowest allowable level, $1.92 per bushel, down $.63 from the previous year. In addition, government agricultural program expenditures are being reduced by other legislation, the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Reduction Act also passed in late 1985. With a 4.3 percent expenditure reduction to decrease the U.S. federal budget deficit, this lowers the effective 1986 U.S. corn loan rate by an additional $.08 per bushel.

For the 1987 through 1990 corn crops, the statutory loan will be 75 to 85 percent of the immediately preceding five-year average price received by farmers, excluding high and low years and with a provision that loan rates cannot be reduced more than 5 percent from the preceding crop year in any one year. These adjustments could reduce the nominal loan rate for U.S. corn to as low as $1.56 per bushel ($61.50 per metric ton) in 1990, provided a sharp downward trend in world grain prices occurs in 1986-89.[41] In addition, the effective loan rate could be reduced from the nominal level by still to be determined amounts resulting from the Gramm-Rudman-Hollings Act. Even more flexibility in U.S. price support levels is provided by authorization of the Secretary of Agriculture to use marketing loans or loan deficiency payments if necessary to compete effectively in world markets. Marketing loans would allow producers to repay their price support loans at the higher of either the market price or 70 percent of their loan rate if market prices are below the loan. Loan deficiency payments would provide direct cash payments to producers to compensate for cash prices that are below the loan rate, if the producer chooses to forego use of the government loan program.

These tools, if implemented, would substantially reduce the effective market price support levels stemming from the U.S. farm program. They are a clear signal that the U.S. Congress is serious about increasing the competitiveness of U.S. agricultural

Figure 53. U.S. Corn, Wheat, and Soybean Price Support Loan Rates, 1947-48 to 1986-87.



Source: U.S. Department of Agriculture, Economics and Statistics Service, *Grain and Feed Statistics through 1961*, Statistical Bulletin No. 159 (Washington, D.C.), revised June 1962. USDA-EES, *Feed Situation*, FDS 228, April 1969; FDS 231, November 1969; FDS 241, November 1971; FDS 246, November 1972; FDS 260, February 1976; FDS 264, February 1977; FDS 268, February 1978; FDS 272, February 1979. USDA, Economic Research Service, *Feed Outlook and Situation*, FDS 282, August 1981; FDS 286, August 1982; FDS 292, March 1984; FDS 295, November 1984; FDS 299, March 1986. USDA-ERS, *Wheat Outlook and Situation Yearbook*, WS 274, February 1986. USDA, Agricultural Marketing Service, *Background for 1985 Farm Legislation*, Agricultural Information Bulletin No. 472, 1985.

exports and in halting the rapid decline in U.S. shares of world exports. Implementation of these drastic changes in U.S. support mechanisms would have far-reaching implications for farmers in other grain exporting nations, grain exporting firms, other international agribusiness industries, and costs of government agricultural programs in the U.S. and other nations. The U.S. price support programs traditionally have provided downside support to world prices, with foreign exporters tending at times to price their products slightly below U.S. levels if necessary to clear the market and avoid sharply increased carryover stocks. The Food Security Act of 1985 appears to be a signal to other exporting nations that they must either share the burden of matching market-available supplies with effective demand, or pay a penalty in the form of very depressed prices resulting from the lower U.S. loan rates. As an indication of how the U.S. administration and Congress view this new flexibility in setting support levels, in the spring of 1986, this newly acquired authority was used fully on two crops by implementing marketing loans on 1986-crop cotton and rice.

Loan Rates for Other Crops Also Lowered

Loan rates for other grains are established through formulas similar to those for corn. For example, the nominal U.S. average loan rate for 1986-crop wheat has been reduced to $2.40 per bushel ($88.30 per metric ton), down $.90 cents per bushel from the 1985 level. Gramm-Rudman-Hollings cuts make the effective loan rate $1 per bushel ($36.80 per metric ton) below the comparable level for the 1985 crop. With depressed prices in the 1986-89 period, the 1990 nominal loan rate could decline to as low as $1.95 per bushel ($71.66 per metric ton).[42] The effective loan rate could, under certain conditions, be reduced even more through Gramm-Rudman-Hollings cuts or by implementation of marketing loans or loan deficiency payments.

The 1986 and 1987 average soybean loan rates by law may be no higher than $5.02 per bushel, the same as in 1985. However, if the agriculture secretary determines these levels discourage exports, the loan rate can be reduced by up to 5 percent per year, with a minimum lower level of $4.50 per bushel. The 5 percent reduction would lower the 1986 loan rate to $4.77 per bushel ($175.30 per metric ton), with the effective loan rate being reduced still further because of Gramm-Rudman-Hollings cuts. For 1988 through 1990 crops, the loan rate is scheduled to be 75 percent of the immediately preceding five-year average price received by farmers, excluding the high and low years, with a $4.50 per bushel minimum level and a constraint that the loan rate for any individual year may not be reduced more than 5 percent from the previous year. Loan rates for other feed grains are based on formulas similar to those for corn.[43]

Target Prices Lowered for 1988-90

While loan rates are the main price support mechanism in U.S. farm programs for most major crops, income support for producers is linked more directly to target prices. For 1986 crop corn, producers participating in the government acreage control program will be eligible for deficiency payments to make up some or all of the difference between the target price and the market price if prices received by farmers are below the target price. Maximum deficiency payments for this year's corn crop will be $1.11 per bushel, the difference between the nominal loan rate of $1.92 and the target price of $3.03 per bushel. With market prices above the loan rate, participating farmers would be paid only the difference between the market price and the target price. Participating farmers would receive the maximum deficiency payment rate on normal production on area planted to corn if average U.S. farm market prices for the September 1986-August 1987 corn marketing year are at or below the $1.92 loan rate. Part of these payments will be made in cash and part will be in commodities, with the cash portion reduced by Gramm-Rudman-Hollings balanced-budget reductions. In addition, payments on the first $.63 per bushel of the corn deficiency payment ($3.03 target price minus $2.40 statutory loan) are subject to a $50,000 payment limit per farmer to avoid unduly large benefits to large farms.

Target prices per bushel for corn for 1987 through 1990 crops are scheduled to be as follows: 1987, $3.03; 1988, $2.97; 1989, $2.88; and 1990, $2.75. For wheat, the target prices established in the Food Security Act of 1985 are $4.38 per bushel for 1986 and 1987 crops, $4.29 for the 1988 crops, $4.16 for the 1989 crop and $4.00 per bushel for the 1990 crop. Before Gramm-Rudman-Hollings budget reductions, these target prices would provide maximum wheat deficiency payments of $1.98 per bushel ($72.76 per metric ton) on the 1986 crop. As with corn and other feed grains, a $50,000 payment limitation applies per farmer, with some exceptions. Soybeans have no target prices and consequently no direct government payments are available for production of soybeans.[44]

Supply-Control Provisions[45]

For half a century, the U.S. has taken on most or all of the role of supply management in world markets in times of surplus U.S. and world production. The Food Security Act of 1985 provides for a continuation of that role if sharply lower price support levels fail to generate enough additional domestic and export demand to reduce carryover stocks substantially. For corn and other feed grains, producers will be required to idle from 12.5 to 20 percent of their feed grain base acreage to obtain program benefits, if U.S. carryover stocks are over 2.0 billion bushels. With carryover stocks at or below 2.0 billion bushels, not more than 12.5 percent of an individual farm's feed grain base acres would need to be idled to qualify for program benefits. For wheat, acreage idling requirements for participation range from 15 to 30 percent of a producer's base when old-crop U.S. wheat carryover stocks exceed 1.0 billion bushels. Maximum acreage idling requirements are 15 percent of the base when carryover stocks drop to or below 1.0 billion bushels. As has traditionally been the case, U.S. soybeans have no acreage idling provisions. Under certain conditions, the Secretary of Agriculture can raise acreage idling provisions above the maximum levels indicated here.

In addition to land-idling features in individual commodity programs, the Food Security Act of 1985 provides for a long-term program designed to idle up to 45 million acres (18.2 million hectares) of erosion-prone cropland for up to 10 years. Land idled under this program must be planted to trees or grass, and mechanical harvesting of these products is forbidden during the life of the contract. Land idled under this program will be well below average in productivity, since it will represent steeper sloping fields and those in less humid areas that are subject to wind erosion. A sizable part of the land idled under the long-term program may come from wheat, small grains, and soybean production. The 1985 farm act also contains "sodbuster" and "swampbuster" provisions that would make farmers bringing such land into production ineligible for government price support programs.

Along with these features, wheat legislation provides authority for the U.S. Secretary of Agriculture to implement strict marketing quotas and much higher price support levels, if 60 percent or more of U.S. wheat growers approve such a plan in a referendum. Marketing quotas in that case would come into effect as an alternative to the price support and acreage control programs outlined above. To be implemented, the quotas would have to be approved by a referendum by August 31, 1986. At this writing, it appears highly unlikely that this alternative would be requested by the Secretary of Agriculture.

Grain Reserve Programs[46]

In recent years, the farmer-owned Grain Reserve Program has become a key supply-management tool in U.S. farm policies. When supplies exceeded market demand, farmers were paid to continue storing grain for three to five years and were permitted to sell such grain only if prices rose sharply or if the grain was deteriorating in quality. The reserve program remains in effect for the years immediately ahead. However, new legislation directs the Secretary of Agriculture to establish upper limits on the amount of wheat in the reserve at 30 percent of estimated total annual domestic and export usage, with the standard upper limit on feed grain reserve stocks at 15 percent of total annual domestic usage. Higher reserves equal to 110 percent of these levels can be established at the Secretary's discretion. Maximum limits on reserve stocks will become effective toward the end of the 1986-87 marketing years, when this year's crops normally would become eligible for entry into the reserve program.

Implications for U.S. and World Agriculture

The 1985 Food Security Act is a complex piece of legislation that could conceivably be modified by Congress, but is likely to provide the overall direction for U.S. farm policy until the end of the decade. It signals a shift in U.S. price support programs somewhat in the direction of the EC support system, with domestic crop incomes to producers being supported well above world levels through the target price system. These policy changes appear likely to exert downward pressure on U.S. and world grain prices in 1986-87 and possibly until the end of the decade, given average or better grain yields in major producing areas. Lower prices will reduce incentives for increased production in U.S. as well as in other exporting nations, and also will tend to increase grain utilization by making livestock and poultry products affordable to a larger segment of the developing world. With time lags of one to three years, these developments should begin to move grain production and utilization toward equilibrium levels. However, in the next year or two, U.S. and world grain stocks could continue their upward trend.

Reduced U.S. price support levels appear likely to reduce grain prices received by farmers in such exporting nations as Canada, Argentina, Brazil, Australia, South Africa, and Thailand. In countries whose domestic agricultural programs support prices well above world levels, such as the EC nations, government expenditures for farm programs almost certainly will rise sharply and political pressure may shift in the direction of lower agricultural price supports. In importing nations, lower prices will be advantageous for domestic consumers in the short run, but will work against incentives for increased self-sufficiency in agricultural products. In addition, the lower level of world prices may increase temptations of the U.S. and other nations to follow protectionist trade practices such as import restrictions to shield domestic producers from foreign competition. Until world utilization begins to respond to lower farm product price levels, a danger of trade subsidy wars in agricultural exports also exists. The most likely candidates for initiating such a trade war are the U.S. and the EC. In case of progressively larger export subsidies, world prices would likely face increased downward pressure and would tend to worsen the already difficult plight of farmers in other nations not protected by government deficiency payments. With these potential adverse effects, caution will likely be used in implementing some of the U.S. policy tools provided in the U.S. Food Security Act of 1985. Included in this category are export subsidies, export Payment-in-Kind programs, marketing loans, and loan deficiency payments.

Impact of Expanded European Community on Agricultural Trade

Spain and Portugal joined the EC on January 1, 1986, after eight years of negotiation. This is the third enlargement of the EC since the original six member states were joined together in 1958. Spain and Portugal's admission to EC will give those two countries access to an enlarged home market of approximately 320 million consumers. And the enlarged EC should enhance the political and military stability of western Europe. Over time, their adjustment to EC agricultural policies appears likely to increase the two nations' demand for soybeans and protein meal, but will likely have a negative impact on U.S. grain exports.

Entrance to EC requires Spain and Portugal to adopt the community's common agricultural policy (CAP) by gradually harmonizing their agricultural policies with the CAP during an extended transition period. Adoption of CAP will lead to changes in relative prices, production, and consumption of some agricultural products in the two countries, which is the source of the expected changes in trade patterns. The following sections provide an overview of recent Spanish and Portuguese agricultural trade, required policy adjustments, and indications of potential trade impacts.

Spain's Agriculture and Trade

Preliminary data place Spain's average annual imports of all products during the 1981-83 period at $30.8 billion, with 12.5 percent of the total being agricultural products. Nearly one-fourth of its agricultural imports have been cereals, and nearly 95 percent of the cereals were feed grains. Oilseed, oil nut, and oil kernel imports accounted for another 22 percent of the country's agricultural imports, with 95 percent of these products being soybeans. Historically, Spain has been an importer of U.S. corn, soybeans, barley, sorghum, and soybean meal for several years. Its demand for U.S. corn reached a peak at the turn of the decade, then declined sharply from 1981-82 through 1984-85, as its crops recovered from severe drought and a strong U.S. dollar discouraged imports. U.S. corn exports to Spain totaled 183 million in 1980-81, but declined to 92 million bushels in 1984-85. U.S. soybean, soybean meal, and sorghum exports to Spain followed a similar pattern of gradual decline from 1981-82 to 1984-85. Its U.S. soybean imports totaled 110 million bushels in 1981-82 but dropped to only 38 million bushels in 1984-85.

Average annual Spanish exports during the 1981-83 period were $20.1 billion, with 16 percent of the total composed of agricultural products. The nation's exports of fruits, vegetables, wine, and beverages accounted for 77 percent of its agricultural export trade.

Spanish agricultural production increased at an average annual rate of 4 percent from 1960 to 1978, with livestock production increasing more rapidly than crops.[47] Because of rapid growth in its livestock production, Spain now is almost self sufficient in pork, poultry, and beef and is an exporter of eggs. It also has surplus production of olive oil, fruits, and vegetables. Some sources estimate Spain's entrance to EC will raise the community's output of vegetables by 25 percent, fresh fruit output by 48 percent, and olive oil production by 59 percent.[48] However, Spain's net import position in corn, sorghum, and oilseeds will reduce the enlarged EC's self sufficiency levels in these products.

Portugal's Agriculture

Portugal's imports of farm and nonfarm products in the 1981-83 period averaged $9.2 billion annually, with 17 percent of the total being agricultural imports. Cereals, oilseeds, oil nuts, and oil kernels accounted for just over half of its agricultural imports. Its imported cereals were primarily coarse grains, along with slightly over half of its oilseed, oil nut, and oil kernel imports being soybeans. Portugal is an important market for U.S. corn, sorghum, and soybeans. During the 1981-84 period, U.S. corn exports to Portugal accounted for 3 to 5 percent of the total U.S. corn exports. Over this same time period, Portuguese agricultural product exports accounted for 9.9 percent of its total average annual exports of $4.3 billion. Beverage exports made up 46 percent of its agricultural exports, with nearly all beverage shipments being wine. Fruit and vegetables accounted for another 22 percent of its agricultural product exports.

Pre-EC Spanish Agricultural Policies

Spain has used a complex market management system for major agricultural products, similar to that used in the EC-10. The responsibility for regulation of external trade is under the control of two divisions of the Ministry of Agriculture, Fisheries, and Food: The Foundation for the Arrangement and Regulation of Agricultural Production and Prices (FORPPPA) and The National Board for Agricultural Products (SENPA). FORPPA is the decision-making branch while implementation of regulations is left to SENPA. SENPA also subsidizes agricultural product purchases and imports agricultural inputs that are sold to farmers at regulated prices.

Spanish price support programs include price ceilings for consumers (maximum consumer price), a floor price for producers (basic intervention price), a higher intervention price, and an actual intervention price. The higher intervention price is no more than 98 percent of the maximum consumer price. The actual intervention price is 5 percent above the floor price. When the average market price or reference price falls below the floor price, then FORPPA may subsidize processing activities and

Table 21. Self sufficiency ratios for grains, oilseed, and meats in Spain.

Product	1980	1981	1982	1983	1984	1985
	Production as a percent of use					
Wheat	136	83	97	83	101	101
Rice	131	120	108	60	114	114
Corn	36	26	31	30	53	51
Barley	114	79	79	86	113	91
Rye	126	85	75	99	100	N.A.
Oats	93	89	97	101	158	N.A.
Sorghum	38	8	21	9	21	33
Pork	99	100	97	99	100	99
Beef	97	100	93	96	91	99
Poultry	99	99	99	99	99	98
Eggs	106	103	104	103	101	101
Oilseeds	16	18	14	22	24	36
Oilseed meal	97	48	104	102	94	84

Source: "The Effect of Spain's Entry Into EC on the Demand for Imported Corn and Soybeans," Stephen H. Hiemstra, March 1986; contributed paper prepared for presentation at the July 1986 annual meeting of the American Agricultural Economics Association in Reno, Nevada.

increase export restitutions or subsidies.[49] If the reference price is approaching the consumer maximum, then stocks will be released and imports will be permitted.

Agricultural support systems in Spain and EC are similar for many commodities, but with moderate differences in prices in the grain sector. The EC support system permits a relatively wide range of market prices between an intervention level (the floor price) and a threshold price.[50] Figure 54 provides a graphic comparison of the Spanish and EC price support systems.

Most livestock and poultry products in EC are not subject to mandatory intervention and export subsidies, whereas pork and poultry are included in the Spanish price support system.

To harmonize the Spanish price system with that of the EC, one of the intervention prices and the maximum consumer price will be eliminated. After a transition period, Spain's agricultural trade regulations will be set by the EC instead of the Spanish government.

Spain's Transition to EC Policies

With their entry into the EC, both Spain and Portugal will be eligible for funds from the European Agricultural Guarantee and Guidance Fund (EAGGF) and the Regional Fund for Agricultural and Structural Improvement. Financing from these sources will be available from price support programs and to encourage improvements in farm structures, processing, and marketing.[51]

To ease the adjustment to EC agricultural trade and price support policies, a lengthy transition period began on January 1, 1986, when Spain and Portugal officially joined the EC. In sectors where EC market organization will not cause major adjustment problems, a seven-year transition period (conventional transition) is in effect. For certain other sectors, a two-stage transition, known as transition by stages, will be involved. During the first stage, the necessary infrastructure and facilities for the CAP will be developed. In the second stage, Spanish and Portuguese prices for the commodities involved will be aligned with those of the EC.

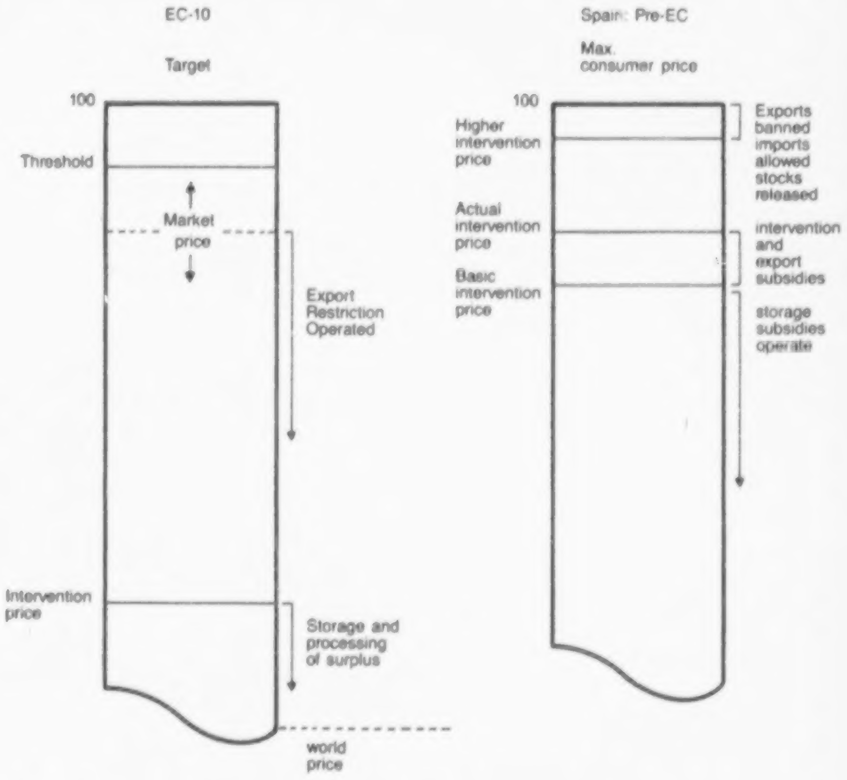
Conventional Transition in Spain

Conventional transition for Spain covers all Spanish products except fruit and vegetables. For these products, EC production control and pricing mechanisms gradually are being phased in beginning with the nation's entrance into EC in early 1986. The seven-year transition will include the following measures:

- Tariff barriers between Spain and the EC-10 removed.
- EC tariffs for trade with third countries adopted, and EC preferential arrangements made for imports from certain third countries.
- For five years, the relationship between consumer prices of olive oil and competing oils will be controlled to prevent a decline in olive oil consumption.[52]
- Spanish olive oil producers will be subsidized.
- During the seven-year period, Spanish prices gradually will be aligned with the EC prices. In cases where there is minimal difference between current Spanish and EC prices, EC common prices will be applied immediately. For products where Spanish prices are substantially higher or lower than EC prices, Spain's prices will be adjusted in seven yearly increments until they are equalized with EC prices.[53]

A first step in this transition was a replacement of Spain's fixed 20 percent import duty on grains with the community's variable levy. This change became effective March 1, 1986,[54] and has tended to increase domestic grain prices by 11 to 15 percent.[55] Over time, that will tend to encourage grain production, discourage grain feeding, and encourage the use of grain substitutes such as soybean meal, manioc or cassava, corn gluten feed, and grain milling byproducts. Expanded utilization of these products will likely reduce Spain's imports of U.S. corn, but could increase its soybean imports.

Figure 54. Graphic Comparison of Spanish and EC Agricultural Support Systems.


EC-10
Target
100
Threshold
Market price
Export Restriction Operated
Intervention price
Storage and processing of surplus
world price
Spain: Pre-EC
Max. consumer price
100
Higher intervention price
Actual intervention price
Basic intervention price
Exports banned imports allowed stocks released
intervention and export subsidies
storage subsidies operate

Source: Agra Europe, Special Report No. 26 (Brussels, Belgium), August 1985, p. 10.

Transition by Stages in Spain

In Spain, transition by stages covers only fresh fruit and vegetables, with the first stage lasting four years. During this stage, trade between Spain, EC-10, and third countries will be conducted under the nation's previous trade policies. EC trade with Spain will be considered mostly as third country trade. After the initial transition, fruit and vegetable prices and trade policies will be adjusted to those of EC in a second six-year transition stage.

Portugal's Policies Before EC Entrance

Portuguese market regulation and price support systems are similar to those in Spain and the EC-10. Its price support system includes two-stage intervention prices for corn, barley, oats, sunflowerseed, dairy products, and meat. If market prices drop below the lower or basic intervention price, the national government has been directed to purchase surplus supplies. When market prices exceeded the upper limit, it has released stocks of these products into commercial channels.

Along with support programs for farm prices, the Portuguese government sets fixed maximum consumer prices for bread, sugar, vegetable oils, eggs, milk, poultry meat, beef, pork, and butter. For large milling and feed compounding firms, the nation also has a system of declared prices under which firms must obtain government approval for price increases.

Conventional Transition in Portugal

For Portugal, the conventional transition period covers oilseeds, fats, processed fruit and vegetables, sheep and goat meat, tobacco, flax, hemp, hops, seeds, dried fodder, peas, field beans, sweet lupins, live plants, flowers, silkworms, and beekeeping. As in Spain, tariff and nontariff barriers on these products between Portugal and the EC will be removed and EC external custom tariffs will be adopted during this period. Producer subsidies will continue to be applied to olive oil while the transition is in effect. Portuguese price levels immediately prior to EC entrance will be used as the starting point in the transition process. For products whose initial prices differed from EC prices by 3 percent or less, EC prices will be applied immediately. For products with more than a 3 percent difference, price adjustments will be made over an extended period.

Transition by Stages in Portugal

Because of substantial differences between Portuguese and the EC marketing systems, a 10-year transition by stages will be applied to milk, milk products, beef, veal, pig meat, poultry, eggs, rice, fresh fruit, vegetables, and wine. In the first stage, recent trade policy with EC-10 and third countries in these products will be maintained. Likewise, the EC-10 will treat Portugal as a third country.[56] Beginning after 10 years, the Portuguese marketing monopoly for these products will be dismantled during a second-stage four-year transition period.

As part of the EC entrance agreement, Portugal agreed to reserve 15 percent of its grain import purchases for EC beginning March 1, 1986 and continuing through the initial transition period.[57]

As in Spain, Portugal's adjustment to the EC variable levy system on grains began on March 1, 1986, and will raise domestic grain prices substantially. Over the longer run, the change will likely encourage increased production and reduced consumption of grains, along with increased use of protein meal and other cereal substitutes. In addition, the requirement that Portugal reserve 15 percent of its grain imports for EC grain could reduce its imports of U.S. corn and wheat by approximately 10 and 3 million bushels, respectively. These reductions would be the equivalent of 0.7 and 0.3 percent respectively of 1985-86 total U.S. exports to all destinations. Potential positive impacts on Portuguese soybean imports also are clouded by a 50,000 metric ton quota on that nation's soybean oil consumption, reportedly being imposed to protect olive producers. That is the oil equivalent of approximately one-half of Portugal's recent annual imports of U.S. soybeans. However, with a quota only on domestic consumption, soybean imports could exceed this level and be processed to meet meal demand, with the excess soybean oil supplies exported.

Declining Oil Revenues and U.S. Agricultural Exports

From the last quarter of 1985 to the first quarter of 1986, world petroleum prices declined by over 50 percent. Modestly higher prices since then have offset a small part of the decline, but in mid-1986 U.S. and world energy prices remained sharply below the levels of recent years. Declining oil prices have the potential to affect agriculture in both positive and negative directions. On the positive side, energy is a major input in both the agricultural and nonagricultural sectors of the world economy. Its price level affects the cost of producing many major farm inputs, as well as conditioning, processing, and transportation costs of agricultural products. Lower energy costs are tending to reduce U.S. and foreign inflation rates, thus permitting slightly lower interest rates than otherwise would be possible. The decline in energy costs also is tending to slightly reduce per unit production costs for U.S. farm products, and in that way is a slightly positive development in the U.S. farm financial crisis.

Lower petroleum prices also are a potentially positive influence on U.S. demand for farm products, as well as on the demand for food and fiber in a large number of oil importing nations. Declining oil prices have provided consumers with additional funds that can be used for dietary improvements, as well as other purposes. Over time, if lower energy prices are sustained for several years, this development will likely generate increased demand for livestock and poultry products in oil-importing developing nations. In the U.S. it appears that consumers have used a substantial part of the energy cost savings to reduce debts and replace durable goods worn out during the years of high interest rates and rapid inflation. Even so, reduced petroleum prices should have a slight positive effect on U.S. demand for farm products. The potential effect will be larger in such major oil importing countries as Japan, Korea, Taiwan, Brazil and Argentina, and slightly positive in Eastern and Western Europe. In Brazil, and Argentina, reduced energy costs may help accelerate domestic economic growth, increasing domestic demand for farm products and tending to reduce export availabilities over levels that would otherwise exist. Reduced energy import costs also are a positive influence on the balance of trade for these nations, and tend to slightly ease external debt-servicing problems. However, a time lag of at least two or three years may be needed for these positive effects on agriculture to emerge.

Lower petroleum prices also raise questions about the impact on U.S. agricultural exports to petroleum exporting nations. U.S. agricultural exports to these countries as a group increased substantially in the last decade. However, sharply reduced purchasing power as a result of lower oil prices appears likely to halt or reverse that trend.

As shown in Table 22, agricultural products likely to be most affected include poultry and poultry products, other meats and wheat. Imports of these products by oil exporting nations, as a group, grew rapidly from 1972 to 1981, as large oil revenues brought dietary changes. However, that trend has been reversed in the past three or four years. Earlier growth was most pronounced for poultry imports, with a 939 percent expansion between 1972 and 1981. But by 1984, poultry imports by oil exporters as a group had slipped 29 percent below the 1981 record, with declines in most areas except the North Sea and other developing nations. Other meat imports by oil exporters as a group rose by 165 percent from 1972 to 1981 and have remained nearly stable since that time. Wheat and flour imports by these nations nearly doubled during the earlier period, but have since declined by about one-fourth. As an exception to the trend of the last four years, wheat and flour imports by the Mideast and North Africa have shown a strong upward trend since 1981. During the first half of the 1980s, wheat and flour imports by other developing oil exporting nations remained relatively steady, but declined in the other three groupings of oil exporting nations.

Future trends in agricultural exports to these markets likely will be sensitive to trends in petroleum prices. Through midyear, the decline in prices appeared to be reducing oil revenues to Mideast and North African nations by approximately $35 to $45 billion per year. Lower energy prices reflect conservation efforts resulting from rapidly rising prices of the 1970s, development of alternative energy sources, and substantially increased petroleum production in non-OPEC regions in the last decade, including the North Sea, Mexico, and the north slope of Alaska. Since 1977, OPEC's crude oil production reportedly has fallen approximately 50 percent, with its share of world oil exports dropping from two-thirds to one-third in the same time period.

Table 22. Imports of Selected Products by Oil Exporting Nations, Selected Years, 1972-84.

Product and Region	1972	1977	1980	1981	1982	1983	1984
Poultry (000 metric tons)							
Mideast and N. Africa	26.0	192.0	368.7	627.2	570.4	502.2	455.3
Western Hemisphere	6.8	25.6	24.9	54.2	39.1	26.8	37.4
North Sea	9.6	10.7	28.7	24.5	28.2	51.9	54.3
USSR	44.9	120.7	159.0	253.4	260.2	205.6	113.8
Other developing nations	7.1	29.6	23.6	21.8	30.1	26.4	31.1
Total	94.4	378.6	604.9	981.1	928.0	812.9	691.9
Other Meats (000 metric tons)							
Mideast and N. Africa	57.1	434.1	916.3	1204.1	1200.7	1208.4	2242.8
Western Hemisphere	127.3	232.1	168.6	243.5	218.4	206.9	269.0
North Sea	802.8	654.2	638.3	538.9	592.4	538.6	526.2
USSR	85.0	560.6	739.6	905.1	854.6	886.8	666.3
Other developing nations	46.0	98.4	104.5	74.8	155.9	161.8	152.6
Total	1118.2	1979.4	2567.3	2966.4	3022.0	3002.5	2856.9
Wheat and Flour (mil. metric tons)							
Mideast and N. Africa	5.097	10.292	14.368	14.551	15.340	18.923	20.453
Western Hemisphere	1.481	1.423	1.908	2.261	1.498	1.578	1.568
North Sea	4.714	4.172	2.636	2.246	2.009	1.646	1.474
USSR	8.481	7.142	16.032	18.678	2.216	2.225	2.728
Other developing nations	2.420	2.730	3.868	3.467	3.604	4.099	3.969
Total	22.193	25.759	38.812	41.203	24.667	28.471	30.192

Source: Personal communications with officials of U.S. Department of Agriculture.

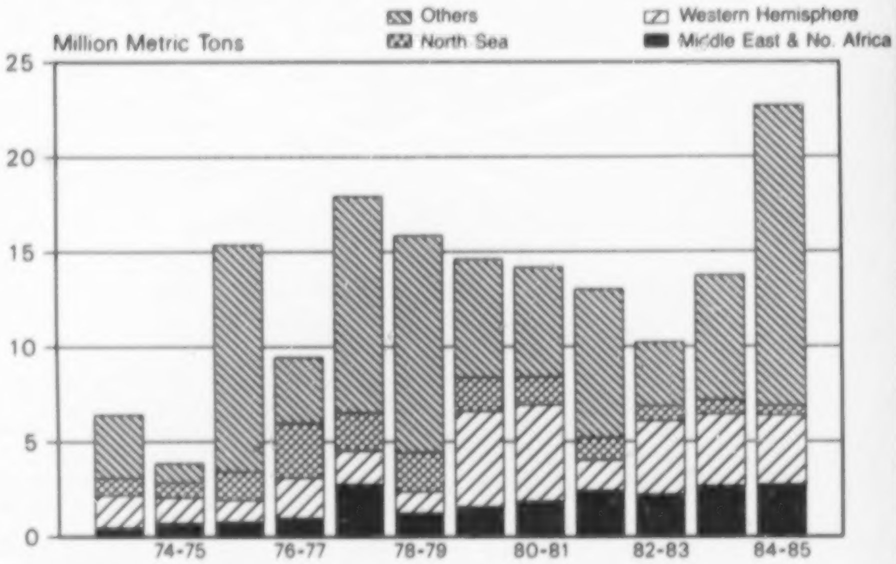
In the years just ahead, the trend toward energy conservation may slow but probably will not be halted completely. Lower prices will slow or stop new oil exploration activities and also will cause production to be halted in some marginal producing areas. However, the demand for petroleum is believed to be highly inelastic in the short run, so that consumption increases only slightly with sharp declines in prices or is reduced only slightly with sharply higher prices. Inelastic demand and OPEC's much smaller market share than in the 1970s may temper increases in petroleum prices in the next one to three years. If so, that would likely reduce oil exporters' purchases of agricultural imports, partially offsetting a tendency toward increased imports of farm products by energy importing nations.

U.S. Exports to Oil-Exporting Nations

As Figures 55 and 56 show, U.S. corn and wheat exports to the Mideast, North Africa, and other developing nations grew rapidly during the 1970s, and continued to expand into the mid-1980s despite declining U.S. exports to other areas. Combined U.S. corn exports to these areas in fiscal 1984-85 accounted for 6 percent of all U.S. corn exports, with an additional 9 percent being shipped to oil exporting nations in the North Sea and Western Hemisphere areas. When the Soviet Union is included, 48 percent of the 1984-85 U.S. corn exports went to oil exporting nations. Including USSR, 36 percent of the total U.S. 1984-85 wheat exports were sold to oil exporting nations. About one-tenth of U.S. wheat exports were shipped to oil exporters in the Mideast and North Africa, 3 percent to Western Hemisphere oil Exporters and 6 percent to other non-Soviet developing nations. About 16 percent of the total U.S. wheat exports that year went to USSR.

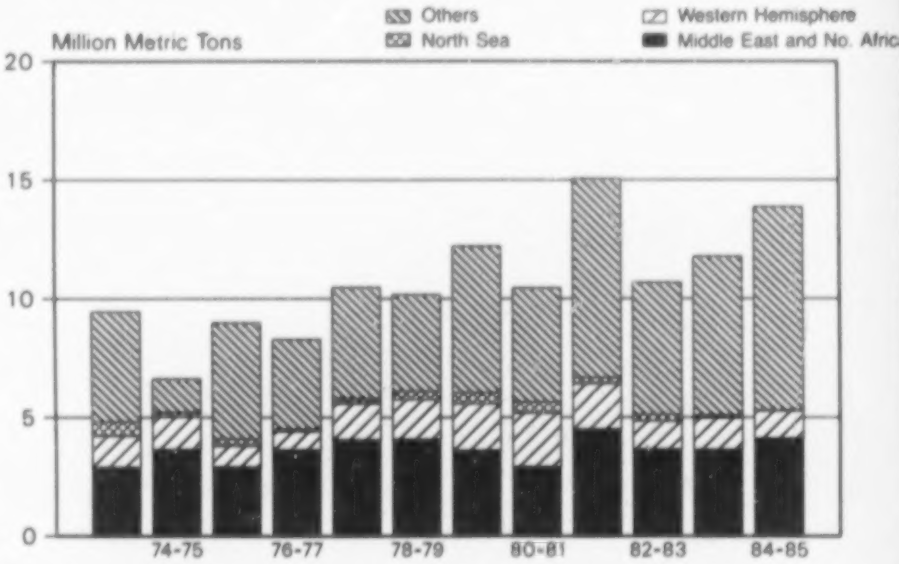
With nearly one-half of U.S. corn exports and one-third to one-fifth of U.S. wheat exports accounted for by oil exporting nations, the sharp decline in petroleum prices may slightly reduce the demand for U.S. grain in these areas in the next year or two. The exact level of U.S. grain purchases by these nations will depend on domestic grain production, priorities placed on food vs. industrial imports, political relationships with the U.S., and U.S. government export enhancement programs. In 1985-86, the U.S. wheat Export Payment-in-Kind program was targeted largely to mideast countries. A continuation of that pattern in 1986-87

Figure 55. U.S. Corn Exports to Oil Exporting Nations, 1973-74 to 1984-85.



Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues.

Figure 56. U.S. Wheat Exports to Oil Exporting Nations, 1973-74 to 1984-85.



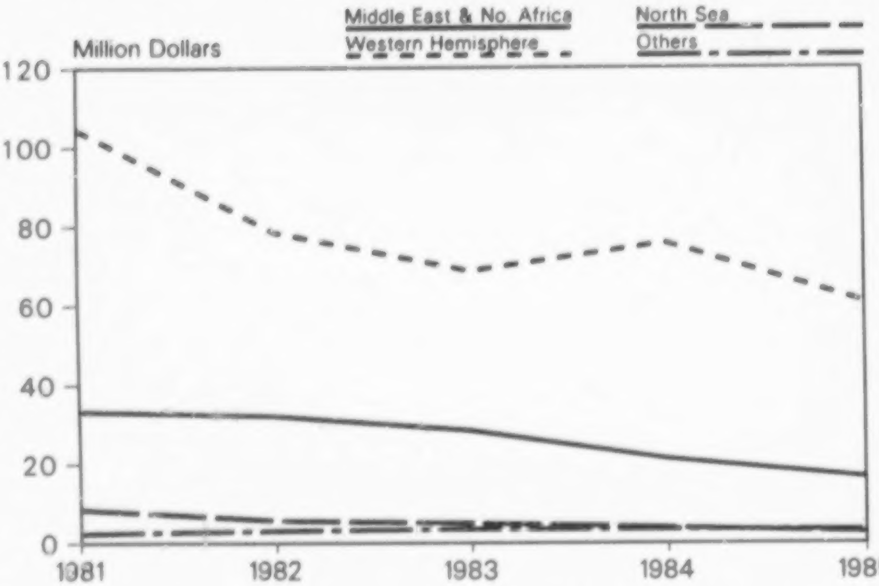
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues.

would help to support grain import demand in that part of the world, despite lower petroleum prices.

Trends in U.S. exports to non-Mideast oil exporting nations indicate most of those areas, except for USSR, have already reduced their grain imports in the last few years in response to various economic forces. Without offsetting export-assistance programs from the U.S., it would not be surprising to see exports to these nations continue to trend slightly downward during the next one to three years. However, declines in these export markets appear likely to be offset by increased demand in oil-importing nations as a group. Soviet imports also may be influenced some by declining petroleum revenues, but will depend heavily on that nation's domestic grain production levels and the priority given to maintaining or increasing per capita availability of meat, poultry, and dairy products.

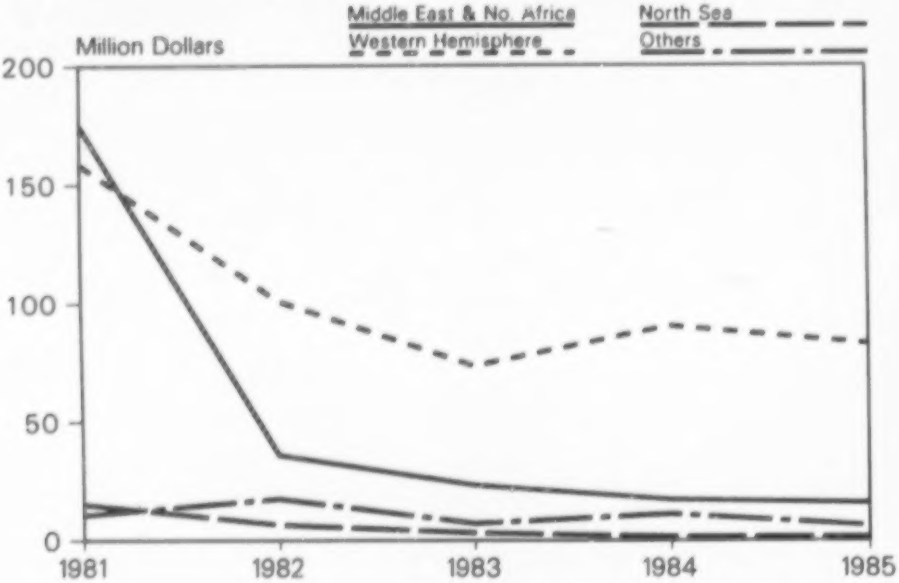
Except for exports to a few other developing nations (primarily Malaysia and Indonesia), U.S. red meat and poultry exports to oil exporting nations have performed much less favorably than has been the case with grains (see Figures 57 and 58). U.S. exports of these products to nearly all oil exporters have dropped sharply since the start of the decade. Declining oil revenues will do nothing to reverse this trend, and in fact, could slightly accelerate recent downward trends in the short term.

Figure 57. U.S. Red Meat Exports to Oil Exporting Nations, 1981 to 1985.



Source: Personal communications with officials of U.S. Department of Agriculture, Economic Research Service.

Figure 58. U.S. Poultry Exports to Oil Exporting Nations, 1981 to 1985.



Source: Personal communications with officials of U.S. Department of Agriculture, Economic Research Service.

Trend Toward Increased Barter Trading

In the last few years, barter trading, sometimes referred to as countertrade, has increased in importance for developing nations and centrally planned economies. While it is not a new development, its growing importance was recognized in the U.S. Food Security Act of 1985. That legislation includes a strong encouragement from Congress for the U.S. to become involved in barter trading for strategic raw materials. The act authorizes barter trading with CCC-owned U.S. agricultural commodities, and instructs the Secretary of Agriculture to provide technical assistance in such trading for U.S. exporters who requested it.[58]

The main incentives for barter trading are a lack of foreign exchange in developing nations and inadequate financing to obtain needed imports by more usual marketing methods. This category of trading can include exchange of goods and/or services from one country for goods and services of another. Or in other variations, it can include counterpurchases or bilateral clearing accounts.[59] Some observers express concern that this process bypasses normal market mechanisms, and in that way avoids realistic price determination and subjection of exporters to consumer quality demands that normally would be communicated through market channels. As a result, prices involved may be artificially high, quality of goods may be low, and dumping of products into developed countries may occur, with dumping being sales at prices below original production and marketing costs.

The U.S. barter trade in farm products has never been very large, even though the practice has been used by the U.S. as far back as the 1950s. It is doubtful that the practice will grow into a major outlet for the nation's agricultural exports. Despite its weaknesses, barter trade can be a distinct advantage for some countries and in some cases, could conceivably be a tool that would facilitate economic growth and eventual development of more conventional markets for farm products.

Longer-Term Prospects for U.S. and World Agricultural Trade

With dramatic changes in U.S. agricultural policy being implemented in 1986, a key question for both the production agriculture and agribusiness sectors is: "Will the lower farm price support levels encourage a quick recovery in the U.S. share of world agriculture trade and in the level of U.S. exports?" To answer this question, the Food and Agricultural Policy Research Institute at Iowa State University and the University of Missouri, in cooperation with Wharton Econometric Forecasting Associates, has developed econometric projections of U.S. and world trade in major agricultural commodities to 1994-95. These projections are based on the assumptions of no major weather disasters or political upheavals and no major alterations of U.S. agricultural policies from those prescribed by the U.S. Food Security Act of 1985.

In general, the forecasts show a continuation of recent trends in world agriculture, with consumption of major grains remaining in a gradual long-term upward trend. Area planted to grains is expected to remain relatively constant in most major grain exporting nations. However, yields both in the U.S. and non-U.S. producing areas are forecast to increase modestly through the mid-1990s and to adequately meet the anticipated growth in world consumption. India is projected to remain a small net exporter of wheat, along with a continued slight downward trend in China's wheat imports and modestly increased Soviet imports of wheat and coarse grains. The EC coarse grain exports are expected to increase substantially during the same period. The U.S. wheat and coarse grain exports are forecast to resume modest upward growth beginning in 1986-87 and continuing through 1994-95. However, 1994-95 coarse grain exports are projected to fall about 12 percent short of the record 1979-80 level. The U.S. wheat exports in 1994-95 are indicated to remain about 6 percent below the previous record level of 1.77 billion bushels reached in 1981-82. Soybean exports from the U.S. are projected to be nearly equal to the 1981-82 record by 1989-90, and to exceed that record by 14 percent in 1994-95. A resumption of growth in exports, increased domestic processing and grain feeding, and government incentives to reduce crop plantings are forecast to gradually reduce U.S. carryover stocks of major crops beginning in late 1988. By 1994-95, ending U.S. corn carryover stocks are projected to be approximately half the level expected for 1985-86. Prices received by farmers are projected to increase moderately beginning in 1991-92. U.S. wheat carryover stocks are indicated to drop to about half the current level by 1991-92 and to coincide with an uptrend in wheat prices forecast to start at that time. Soybeans and cotton are indicated to move into declining carryover stocks situations earlier than grains, with stocks of both these crops beginning a gradual long-term downward trend in the 1986-87 marketing year. Soybean stocks are indicated to decline to about half the current level by 1989-90, with cotton reaching that point in 1991-92. Prices for both crops are forecast to begin a modest upward trend in the early 1990s, but are indicated to be in a downward trend until then because of reduced U.S. government price support levels. A similar price pattern is indicated for wheat, corn, and other feed grains.

These forecasts of U.S. and world exports of major crop products are summarized in Table 23. In general, they reveal longer-run trends that point to continued substantial excess production capacity in U.S. agriculture into the mid-1990s. Excess capacity is likely to be restrained somewhat by production control programs specified in the Food Security Act of 1985. These programs, however, may require several years to reduce the nation's carryover stocks to levels generally considered acceptable in the U.S. In the meantime, costs of U.S. farm income support programs will be large, and could conceivably generate pressure to modify the 1985 farm legislation. Part of the cost of balancing global production and utilization also will be transferred to other nations through lower U.S. price support levels and likely downward pressure on world prices. These costs will likely appear in the form of rising farm program expenses in EC, reduced farm incomes and asset values in areas such as Canada, Australia, and parts of Latin America, and reduced incentives to increase self-sufficiency in developing nations that have serious food problems.

Table 23. U.S. and World Net Export Forecasts for Wheat, Coarse Grains, Soybeans, and Soybean Meal in 1990-91 and 1994-95, and Comparisons with 1985-86 in Millions of Metric Tons.

Commodity	Prelim. 1985-86	Forecast 1990-91	Forecast 1984-85
World wheat	87.6	99.81	111.62
U.S. wheat	24.5	37.97	45.30
Non-U.S. wheat	63.1	61.84	66.32
U.S., percent of world	27.9	38	40.6
World coarse grains	87.3	94.32	106.23
U.S. coarse grains	41.6	58.18	62.96
Non-U.S. coarse grains	45.7	36.14	43.28
U.S., percent of world	47.7	61.7	59.3
World soybeans	27.10	30.08	33.13
U.S. soybeans	21.23	25.27	28.26
Non-U.S. soybeans	5.87	4.81	4.87
U.S. percent of world	78.3	84.0	85.3
World soybean meal	19.10	18.85	20.54
U.S. soybean meal	5.44	5.98	6.91
Non-U.S. soybean meal	13.66	12.87	13.63
U.S., percent of world	28.5	31.7	33.6

Sources: Forecasts are from FAPRI-Wharton, *Long-Term International Oulook*, Food and Agricultural Policy Research Institute, Iowa State University (Ames, Iowa); University of Missouri (Columbia, Mo.); and Wharton Econometric Forecasting Associates (Philadelphia), Spring 1986. The 1985-86 data are from U.S. Department of Agriculture, Foreign Agriculture Service, *Foreign Agricultural Circular, Oilseeds and Products*, FOP 5-86, May 1986, and *Foreign Agricultural Circular, Grains*, FG 5-86, May 1986.

Emerging Trade Policy Issues for U.S. and World Agriculture

The financial condition of U.S. agriculture and related economic sectors has deteriorated substantially in the past four years, due in part to the sharp decline in the nation's agricultural exports and various factors behind the declining export demand. Financial stress in American agriculture and agribusiness is shown by the unusually high percentage of U.S. farmers being forced to exit from agriculture through bankruptcy or other means, excess capacity in the U.S. agricultural marketing and transportation system of as much as 40 to 50 percent, severe financial losses and consolidation of firms and operations in the U.S. farm machinery industry, failure of the largest number of U.S. agricultural banks since the 1930s, and a sharp decline in asset values in U.S. agriculture and agribusiness.

To a degree, these problems are not unique to U.S. agriculture, but also are being faced by farmers in other nations. However, such problems appear to be much more serious in the U.S. than elsewhere, for at least three reasons. First is the traditional role of U.S. farm policy as the adjustment mechanism for balancing world supply and demand. Most other exporting nations do not have a policy of building large carryover stocks when world supplies exceed demand. Instead, their agricultural sectors are structured to move excess production into world markets and maintain carryover stocks near normal levels. Long-standing U.S. policies result in much of the world's excess grain production being held in U.S. carryover stocks.[61] Thus, when foreign grain supplies are large relative to demand, U.S. exports tend to decline as other nations market their excess production. Thus, the U.S. becomes a residual supplier; and its carryover stocks rise. Second, this process was accelerated from 1980 to 1985 by the strength of the American dollar, which placed U.S. farm product exports at a competitive disadvantage relative to other exporters. In fact, strength of the U.S. dollar was great enough to permit imports of major farm products such as wheat, soybeans, soybean oil, oats, and pork into the U.S. at times during the past two years, despite sizable import duties. A strong U.S. dollar encourages foreign nations to expand agricultural production and also enables them to market those supplies more easily than would be possible with a weak dollar. While the dollar has dropped substantially in value against several industrial nation currencies since early 1985, it remains quite strong relative to currencies of other major exporters and developing nation importers.

A third factor making U.S. agriculture extremely vulnerable to declining export demand is its large excess production capacity. In the absence of government supply control programs, domestic demand would absorb only about two-fifths of the normal U.S. wheat production, along with one-half of the U.S. soybean crop and two-thirds of the annual U.S. corn production. A healthy and growing export demand thus is vitally important to U.S. agriculture in utilizing its excess production capacity. Other sectors with a major stake in strong export markets include rural communities across the U.S. and workers and firms in the agricultural input, marketing, finance, and transportation sectors.

Trade policies alone will not solve the financial problems of U.S. agriculture. But because of its heavy dependence on exports, realistic domestic policies for U.S. agriculture cannot be formulated without a recognition of their linkages to the export sector and the current export environment. With severe financial stress in U.S. agriculture and a recent progression of events toward an international trade war, there is an increasing urgency for the U.S. and its trading partners to carefully examine policies needed to encourage agricultural exports.

Dealing with Exchange-Rate Problems

To illustrate the depressing effect of the strong U.S. dollar on the nation's farm product exports, a U.S. Department of Agriculture analysis indicates $3 billion of the decline in U.S. farm product exports during 1981-82 can be attributed to strength of the dollar relative to foreign currencies. Almost 10 million tons (400 million bushels) of the decline were assigned to corn exports alone. The authors also indicate a 20 percent trade-weighted inflation-adjusted rise in the dollar over a two-year period would decrease combined U.S. exports of corn, wheat, and soybeans by 16 percent from levels that would otherwise exist, providing other market influences remained unchanged.[62]

With this sensitivity of exports to exchange rates, it appears important to give high priority to policy changes that will promote a stable and reasonable exchange rate of the U.S. dollar. The U.S. dollar's exchange rate, to a large extent, appears to have its roots in U.S. monetary and fiscal policy, including the large U.S. budget deficit and 's resulting decrease in funds available for private borrowing and investment.[63] The deficit is being financed, in part, by an inflow of foreign capital to earn high U.S. real (inflation-adjusted) interest rates. Increased movement of investment funds into the U.S. and reduced U.S. foreign investments tend to strengthen the demand for the U.S. dollar relative to the available supply, thus increasing its value in foreign exchange markets. This process also tends to drain investment funds from other nations, thus tending to reduce foreign economic growth rates and retarding growth of export demand in some traditionally large U.S. agricultural export markets such as Western Europe. Relatively high U.S. real interest rates stem from a restrictive U.S. monetary policy that has been used to offset inflationary pressures from deficit spending. While U.S. interest rates have declined significantly in the last year, the inflation rate also has dropped. In mid-1986, that still left the U.S. with relatively high real interest rates when compared with the average of the 1970s.

More liberal growth of the nation's money supply to finance the budget deficit would almost certainly increase inflationary pressures, with the accompanying dangers of a new round of inflation-induced U.S. private and developing nation debt buildup and more serious adjustment problems in the future. In addition, with U.S. interest rates largely deregulated, renewed inflation would likely increase interest rates, and the resulting interest cost on the currently outstanding U.S. government debt of over one trillion dollars would rapidly increase annual budget deficits.

As an indication of the changing U.S. budget situation, the annual federal budget deficit in 1979 was approximately $28 billion. With a sharp reduction in income tax rates and continued high government spending, it rose to $212 billion by 1985.

With growing concern that the U.S. budget deficit would continue at near a $200 billion annual rate for the foreseeable future, the U.S. Congress in late 1985 passed the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Reduction Act. This act provides for a series of increasingly large annual reductions in expenditures in most categories of the U.S. budget except for social programs and long-term agricultural programs but including defense programs. Its goal is to balance the U.S. budget as the decade of the 1980s comes to a close. At this writing constitutionality of the act is being reviewed. However, it is a complex piece of legislation and includes some possible safeguards to offset a Supreme Court decision that automatic budget cuts are unconstitutional. If this act is implemented continually in the next few years, it may well permit a further decline in real U.S. interest rates and possibly in the exchange rate of the U.S. dollar against developing nations' and other grain exporters' currencies. If so, that would likely be one of several factors tending to shift U.S. agricultural exports into a gradual upward trend in the late 1980s and early 1990s.

Side benefits from dealing with the U.S. budget deficit problem would probably include a decline in interest-related cost pressures on U.S. agriculture and somewhat increased U.S. private investment. Lower real interest rates also would have positive effects on trade by easing interest cost burdens of developing nations. Dealing with exchange rates through monetary policy alone runs the risk of a sharp and disruptive decline in the value of the U.S. dollar. However, a more balanced fiscal and monetary policy approach would appear less likely to cause such reactions. With the far-reaching exchange rate impacts outlined here, U.S. general economic policy developments appear to be at least as important and perhaps more important to U.S. agriculture than changes in its farm price support programs.

Trade Subsidies

Trade subsidies can take several different forms including direct payments to producers and/or processors, price rebates to foreign buyers, subsidized financing terms, or outright donations of products or services to foreign importers. Such subsidies typically are used to increase an exporting nation's share of global trade and/or reduce surplus domestic supplies. The U.S., as well as many other nations, has used such subsidies from time to time. However, during the past two decades, trade negotiations between the U.S. and trading partners have been aimed at reducing export subsidies as well as other restraints to foreign trade. Current U.S. examples of such subsidies include PL 480 export programs, the Export Payment-in-Kind program, and exports of byproduct feed ingredients from the corn milling industry, which are influenced by highway tax exemptions on alcohol fuels.

U.S. trade policy in 1985-86 focused increasingly on grain export subsidies used by the EC to enable its surplus production to be exported. The U.S. share of global exports of several major agricultural commodities has declined sharply in the past four years, and in some cases, the EC share of those same commodity exports has increased. As a reaction to its declining trade shares, the U.S. in mid-1985 implemented an Export Payment-in-Kind Program (Export PIK) initially targeted against EC's subsidized wheat exports. The program involves the granting of bonus quantities from U.S. government-owned grain or other farm product inventories when designated importers purchase commercial U.S. supplies. Its purpose is to make U.S. commercial agricultural exports competitive with subsidized EC exports. Through mid-1986, this program had not been effective in maintaining U.S. grain trade shares, since it had been met by increased EC export subsidies. However, the U.S. Food Security Act of 1985 mandates that U.S. export subsidies will be increased sharply in the next two years.

A major caution should be raised in the use of such trade subsidies, particularly in an environment of relatively static world trade. There is a danger that escalating subsidies could lead to an outright trade war, with each side progressively increasing its subsidies and/or lowering its price to maintain its respective trade share, and with each side incurring progressively larger costs and neither gaining significant market advantage.

Export subsidies of U.S. and other major exporters also tend to have a negative impact on the agriculture of grain-importing developing nations. Such subsidies may depress prices in importing nations, thus weakening or removing the incentive for farmers in developing countries to expand production. In the long run, that could work to the disadvantage of consumers in recipient countries by limiting their nations' ability to become self-sufficient in food production. With these potential disadvantages, it is advisable to use trade subsidies with considerable caution. Such tools should not be expected to solve current food trade problems arising from excessive indebtedness, slow global economic growth, or overvalued currencies.

Debt Problems of Developing Nations

Developing country debt problems are interrelated with factors causing the recent strong U.S. dollar relative to developing nation currencies. Dealing with the exchange rate problem thus should provide partial relief to heavily indebted nations. However, lower real interest rates alone will not completely resolve debt burdens. Many developing nations' loans are very short term in nature. Increasing their repayment period also has been and will continue to be an important tool in helping such countries through current financial difficulties.[64] Other potentially important tools include more restrained monetary and fiscal policies in developing nations and policy measures designed to improve productivity of the economies involved. While the task is a difficult one that will require caution, moderation, and a few more years of adjustment, the outcome is critically important for the world economy. Widespread inability of developing countries to meet debt repayment commitments could endanger multinational lending agencies and risk serious disruption of the world monetary system. Resolution of these problems also will be important for agricultural exporting nations, as well as for the physical wellbeing of people living in developing countries. These nations, as a group, were one of the fastest growing import markets for farm products during the 1970s. With policies leading to economic stability and growth, they may well offer significant growth in demand for U.S. farm products later in this decade or in the early 1990s.

Trade Protectionism

In today's world economy, there are strong pressures for increased protection of domestic industries against foreign imports. For example, the EC has threatened to place limitations on its annual imports of corn gluten feed and meal, and other U.S. farm products. In the United States, domestic content legislation that would require specific percentages of materials in goods sold in the United States to be produced domestically has been considered. In addition, voluntary restraints on Japanese exports of automobiles into the United States have been in effect the last few years.

Protectionist pressures within the U.S. have increased sharply in 1986, with the U.S. imposing nonbinding quotas on imports of EC white wine and other agricultural products in response to EC trade restrictions stemming from Spain and Portugal's admission into the EC. Moreover, at this writing, the U.S. Congress is developing legislation that would require the U.S. to retaliate against imports from nations which consistently run large trade surplusses with the U.S. The U.S. also has restricted imports of Canadian hogs, imposed a tariff on imports of Canadian cedar shingles, threatened to take action against imports from Brazil unless that nation liberalizes policies relating to imports of U.S. products, and has strongly warned EC against tightening its import restrictions.

These are only a few examples of a large list of recent and/or proposed protectionist trade policies. A Washington University study indicates such restrictions currently cost United States consumers $58.5 billion annually in the form of hidden taxes along with additional long-run costs through reduced incentives for innovation and improved productivity.[65] With high unemployment, strong foreign competition, and domestic political pressures, most other major trading nations also are facing strongly increased pressure to protect domestic industries through trade restrictions. However, the lessons of the 1930s should be a reminder that protectionism leads to declining trade and sluggish world economic activity.[66] It should also be recognized that trade requires two-way exchange between nations. One nation's exports generate revenue that is used to purchase its trading partner's products. In short, U.S. agriculture and the U.S. economy have an important stake in resisting current tendencies toward increased trade protectionism.

Food Security

Food security is a critical and complex policy issue for much of the developing world. One aspect of the problem is illustrated by estimates that the caloric intake of more than 800 million people or 60 percent of the population of less developed nations is below the standards established by the United Nations Food and Agricultural Organization and the World Health Organization.[67] These estimates do not reflect quality dimensions of diets in less developed countries such as protein levels and other nutritional requirements.

Another view of current world food security is illustrated by food security standards for grain carryover stocks. Some world food authorities place minimum stock levels for food security purposes at 17 to 18 percent of global annual utilization. Global carryover stocks in 1986 are estimated at 20 percent of annual utilization, slightly above the minimum standard.[68] However, this standard is only a general guideline. The geographic distribution of stocks is important from a food security standpoint and also can have a considerable effect on prices paid to producers in exporting countries if stocks are concentrated in a few major exporting regions, as is currently the case.

Short-run dimensions of food security are oriented largely toward meeting emergency food needs resulting from drought or other natural disasters. Issues still to be resolved here include the desired size and locations of reserve stocks, methods of sharing storage costs, and methods of acquiring and releasing stocks to minimize disruptions in importer and exporter nations. These issues are especially important for the people of Sub-Saharan Africa, the Indian subcontinent and parts of Latin America, where food shortages have been a frequent occurrence in the past.[69]

Long-run dimensions of food security include policies for increasing food production in food deficit developing nations, improved distribution systems, and population trends. Uneven distribution of food reflects severe poverty in many areas. In fact, poverty and distribution problems can be viewed as major elements in the current world food problem because global food production is sufficient to adequately meet the needs of the world's current population.[70] Dealing effectively with these areas will be a major challenge for current and future generations. Its importance is high-lighted by the fact that the third world has been the flashpoint for East-West conflicts.[71] For that reason, food security, poverty or economic well being, and world peace are closely interrelated.

Other Policy Issues

Other important trade-related policy issues include impacts from the use of bilateral trade agreements, strategies for encouraging expanded agricultural production in developing nations, and tax or subsidy policies, which some nations use to enhance competitiveness of value-added export industries. Use of bilateral agreements in world grain and oilseed trade expanded rapidly in the first few years after the United States entered into a long-term grain agreement with USSR in 1976. However, this trend appears to have slowed considerably with growing world surplus stocks. Such agreements typically specify minimum annual quantities of product that exporting nations agree to provide to importers and importers agree to receive. Several of these agreements are being used by Canada, Argentina, Australia, and other grain exporting nations. The United States has a similar agreement with Mexico, although its grain trade agreement with China was allowed to expire at the end of 1984.

Bilateral agreements tend to bypass normal market functions of discouraging utilization when supplies are low and prices are high, and encouraging utilization when prices are low. If use of long-term agreements grows, an increasing portion of the world grain market may be restricted to some degree from performing its normal market clearing and market rationing functions. In this setting, market areas not subject to these and other artificial restraints may be forced to bear an increasing share of the adjustment to changing world grain and oilseed supplies, with a resulting increase in price volatility in such markets. A trend toward expanded use of long-term trade agreements thus would have important implications for developing nations that import grain and are not covered by long-term agreements and also for U.S. grain and livestock producers.

Expansion of production in developing nations is a complex and controversial problem that cuts across cultural, political, technological, and economic disciplines. Progress in this area will be important in meeting long-term food needs of the world's poorest nations. These countries have extremely limited ability to buy U.S. farm products, with little hope for any major change in purchasing power and ability to import food in the next several years.

Examples of policies encouraging exports of value-added products include the soybean industries in EC and Brazil. As noted in an earlier section of this report, the U.S. share of global soybean product exports has dropped substantially in recent years while these two areas have enjoyed a sharply rising share. Because the U.S. soybean processing industry has substantial excess capacity, this issue appears likely to receive additional attention in the next few years. Brazil encourages exports of processed products rather than soybeans by differential export taxes, with a larger tax on soybean exports than on exports of soybean products, as well as by export quotas on soybeans, subsidized interest rates for processors and duty-free imports of equipment used in production of export goods.[72] In the EC, a modest import tax is applied to soybean oil, thus favoring imports of soybeans for processing, rather than imports of both meal and oil. The processing industries in these areas and the U.S. appear to be moving closer to a confrontation. Consequently, this issue may be one of many trade policy questions coming to the forefront in the late 1980s.

Notes

1. Munich-Weihenstephan, "Objective Indicators of Large-Scale Food Shortages?" *Review of International Trade and Development* (Hamburg, Federal Republic of Germany), July-August 1981, pp. 178-182.

2. For a discussion of factors affecting grain stocks in United States, Canada, and Australia, see Carol A. Goodloe, "Grain Stock Policy in the U.S., Canada and Australia," U.S. Department of Agriculture, Economic Research Service, *North America and Oceania, Outlook and Situation Report*, RS 84-1 (Washington, D.C.), 1984, pp. 26-31.

3. Based on U.S. Department of Agriculture, Foreign Agricultural Service, "Rice Trade and Economy of Selected Asian Countries, 1970 to the Present," *Foreign Agricultural Circular, Grains*, FG 15-84 (Washington, D.C.), December 1984.

4. Based on U.S. Department of Agriculture, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-86 (Washington, D.C.), April 1986.

5. *Ibid.*

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Appendix I. Classification of Countries by Economic Category

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Developed Market Economies
- Australia
- Austria
- Canada
- Denmark
- Finland
- West Germany
- France
- Iceland
- Ireland
- Italy
- Japan
- Luxembourg and Belgium
- The Netherlands
- Norway
- Sweden
- Switzerland
- United Kingdom
- United States

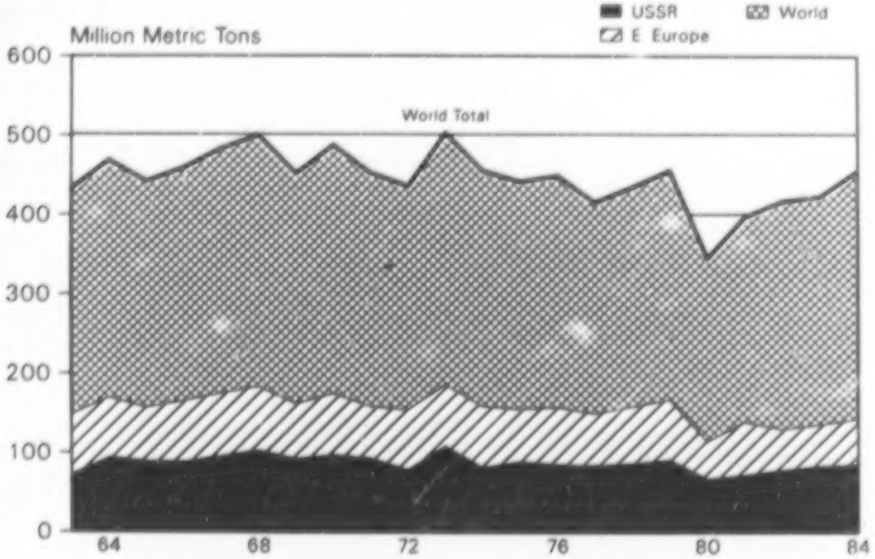
Centrally Planned Economies
- Albania
- Angola
- Bhutan
- Bulgaria
- China
- Cuba
- Czechoslovakia
- East Germany
- Hungary
- Kampuchea (Cambodia)
- Korea (North)
- Laos
- Mongolia
- Mozambique
- Poland
- Romania
- South Yemen
- USSR
- Vietnam
- Yugoslavia

Rapidly and Moderately Developing Nations
- Algeria
- Argentina
- Bolivia
- Brazil
- Cameroon
- Chile
- Colombia
- Congo
- Costa Rica
- Cyprus
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Ghana
- Greece
- Guatemala
- Honduras
- India
- Indonesia
- Iran
- Iraq
- Israel
- Ivory Coast
- Jamaica
- Jordan
- Korea (South)
- Kuwait
- Lenanon
- Liberia
- Libya
- Malaysia
- Mexico
- Morocco
- New Zealand
- Nicaragua
- Nigeria
- Pakistan
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Portugal
- Puerto Rico
- Saudi Arabia
- Senegal
- Singapore
- South Africa
- Spain
- Syria
- Taiwan
- Thailand
- Trinidad
- Tunisia
- Turkey
- Uruguay
- Venezuela
- North Yemen
- Zambia
- Zimbabwe

Other Developing Nations
- Afghanistan
- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Benin
- Botswana
- Burma
- Burundi
- Canary Islands
- Central African Republic
- Chad
- Comoros
- Cape Verde
- Djibouti
- Dominica
- Ethopia
- Equatorial Guinea
- Fiji
- French Pacific Islands
- French West Indies
- Gabon
- The Gambia
- Grenada
- Guinea
- Guinea Bissau
- Guyana
- Haiti
- Hong Kong
- Kenya
- Lee Wind Islands
- Lesotho
- Madagascar
- Malawi
- Maldives
- Mali
- Malta
- Mauritania
- Mauritius
- Nepal
- Netherland Antilles
- Niger
- Oman
- Other West African
- Qatar
- Rwanda
- St. Lucia
- Sao Tome Principe
- Seychelles
- Sierra Leone
- Solomon
- Somalia
- South Pacific Islands
- Southwest African
- Sri Lanka
- Sudan
- Surinam
- Swaziland
- Tahiti
- Tanzania
- Togo
- Uganda
- United Arab Emirates
- Upper Volta
- Western Samoa
- Zaire

Appendix II. Potato, Cassava, and Pulse Production by Major Producing Areas

Appendix II. Figure 1. World Potato Production in Millions of Metric Tons by Major Producing Areas, 1962-84 Calendar Years.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Appendix II, Table 1. Cassava Production in Major Producing Nations from 1973 through 1985 in Millions of Metric Tons.

Area of Country	1973	1979	1981	1982	1983	1984	1985
China	2.0	2.5	3.5	3.6	3.8	11.0	3.8
India	6.4	6.1	5.9	5.3	5.3	5.8	5.8
Indonesia	11.2	13.8	13.3	13.0	12.2	14.2	14.5
Philippines	0.5	2.3	2.3	2.0	2.0	2.0	2.1
Thailand	5.7	11.1	17.7	17.8	19.0	20.0	20.0
Others	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Far East Total*	26.1	36.1	43.2	42.2	42.7	46.5	46.8
Ghana	1.6	1.8	1.7	2.0	1.7	4.1	2.4
Mozambique	2.5	3.0	3.2	3.3	3.2	3.2	3.2
Nigeria	9.6	10.5	11.0	11.7	10.0	11.8	13.0
Tanzania	3.8	5.1	6.0	5.0	5.4	5.6	5.5
Zaire	11.0	12.0	13.2	14.2	14.6	15.0	15.5
Others	12.5	13.6	14.8	15.8	16.1	16.7	17.1
Africa Total*	41.0	46.0	49.8	51.9	50.9	56.4	56.6
Brazil	26.5	25.0	24.5	24.1	21.6	21.3	23.0
Colombia	2.0	1.9	2.2	2.0	1.6	1.7	1.7
Others	3.5	4.1	4.2	4.3	4.2	4.5	4.5
Latin America Total*	32.0	30.9	30.8	30.4	27.3	27.1	29.2
World Total*	101.3	117.6	128.0	128.1	124.9	134.4	136.8

Source: Personal communications with officials of Food and Agricultural Organization of the United Nations.

*Totals may not add up due to rounding.

Appendix II, Table 2. World Pulse Production in Major Producing Areas, 1971-85, in Millions of Metric Tons.

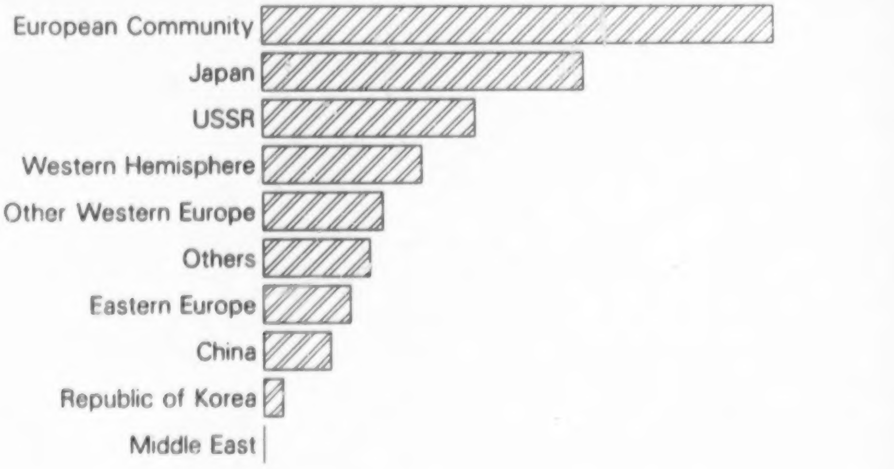
Area or Country	1971	1973	1976	1978	1979	1980	1981	1982	1983	1984	1985
Asia	21.4	20.7	23.0	22.3	22.2	19.7	21.2	21.2	*	*	*
Africa	4.8	4.8	5.8	5.6	5.7	5.4	5.5	5.9	5.5	5.5	5.8
C. America	1.6	1.6	1.3	1.7	1.5	1.8	2.3	1.8	2.2	*	*
S. America	3.4	2.9	2.6	3.0	3.1	2.7	3.2	3.8	2.4	3.5	3.3
N. America	1.1	1.0	1.1	1.3	1.3	1.7	1.9	1.6	1.1	*	*
W. Europe	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.7	0.8	1.0	1.2
E. Europe	1.0	0.7	0.7	0.8	0.7	0.7	0.8	0.9	1.0	1.3	1.2
USSR	6.9	8.4	8.7	7.8	4.3	6.4	5.6	6.5	8.2	7.1	7.9
Oceania	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.6	0.9
World Total	42.6	42.5	44.8	44.5	40.9	40.5	42.6	45.3	46.3	47.7	50.4

Sources: Food and Agricultural Organization of the United Nations (Rome, Italy), *Food Outlook 1983 Statistical Supplement*, March 1984; *Food Outlook 1984*, July 1984; *The State of Food and Agriculture 1984*, November 1984, and personal communication with officials of Food and Agricultural Organization of the United Nations.

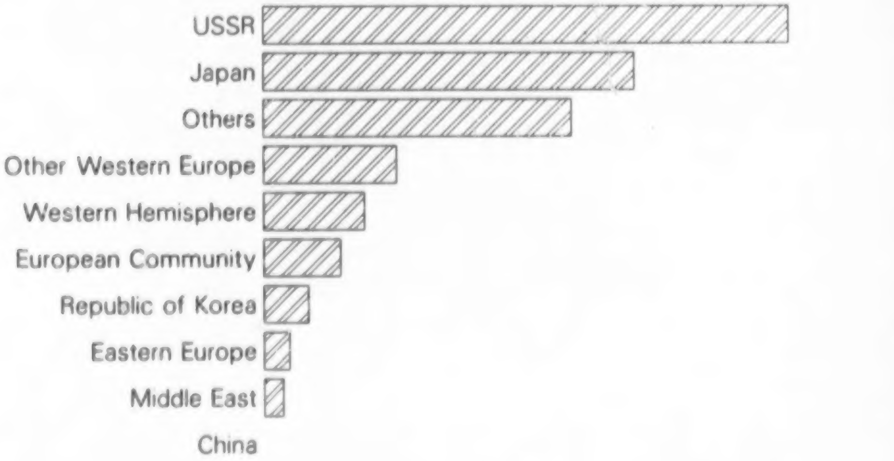
*Data not available.

Appendix III. Flow Patterns and Table Showing Destinations and Ports of U.S. Grain Exports in 1973-74 and 1984-85

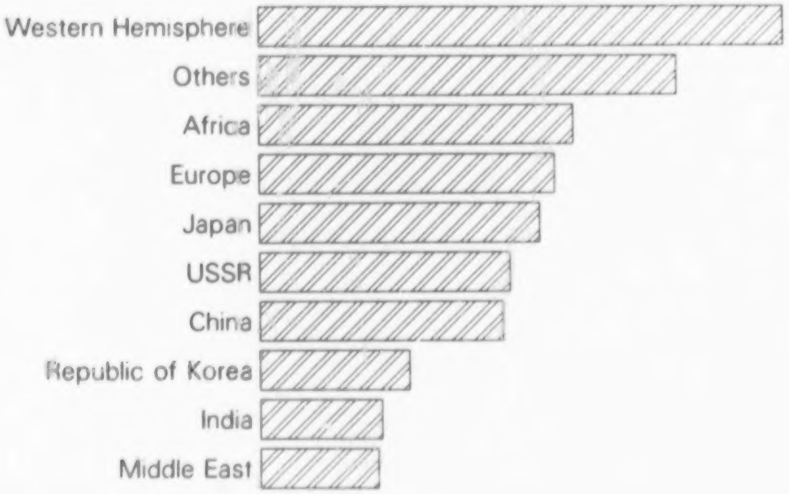
Appendix III. Figure 1. Relative Shares of U.S. Corn Exports to Major Foreign Destinations in 1973-74.



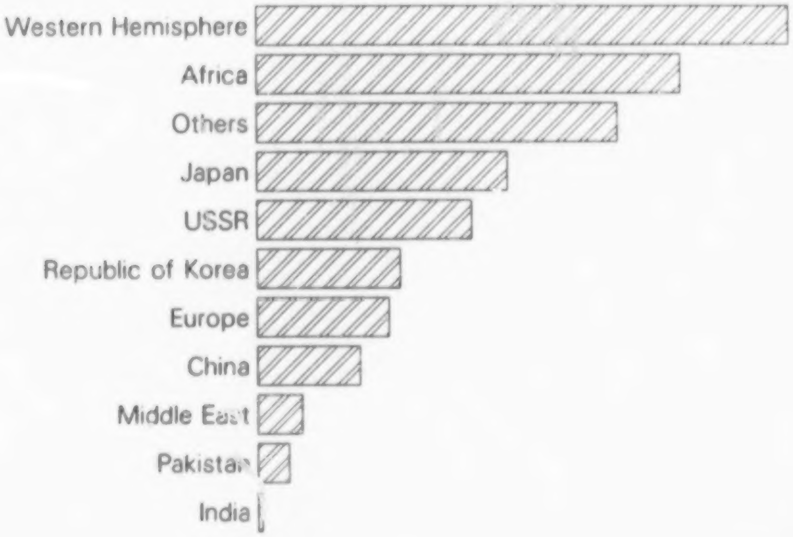
Appendix III. Figure 2. Relative Shares of U.S. Corn Exports to Major Foreign Destinations in 1984-85.



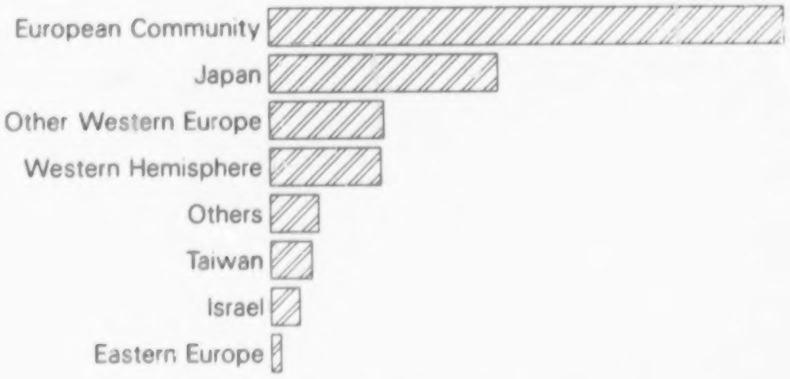
Appendix III. Figure 3. Relative Shares of U.S. Wheat Exports to Major Foreign Destinations in 1973-74.



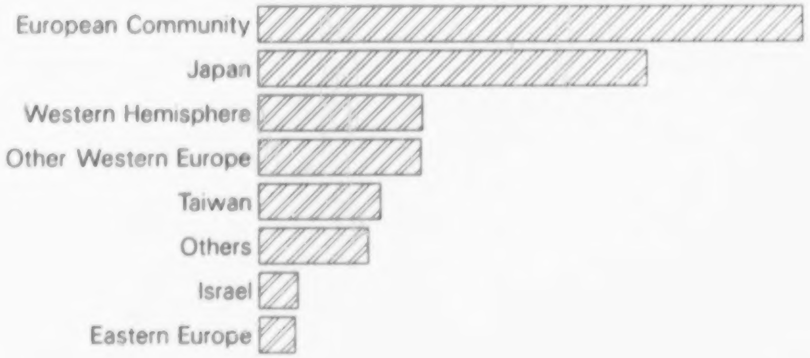
Appendix III. Figure 4. Relative Shares of U.S. Wheat Exports to Major Foreign Destinations in 1984-85.



Appendix III. Figure 5. Relative Shares of U.S. Soybean Exports to Major Foreign Destinations in 1973-74.



Appendix III. Figure 6. Relative Shares of U.S. Soybean Exports to Major Foreign Destinations in 1984-85.



Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), calculations various issues.

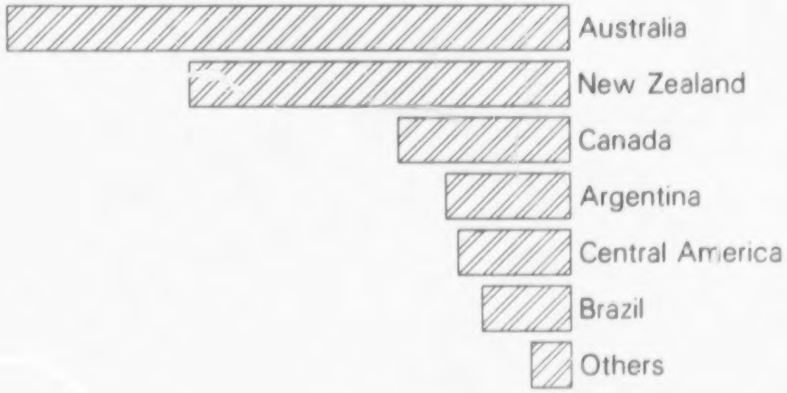
Appendix III, Table 1. U.S. Grain and Soybean Exports in Thousands of Metric Tons by Port Areas, October-September 1972-73 and 1984-85.

Commodity	Fiscal Year	Lakes	Atlantic	Gulf	Pacific	Interior	Total
Corn	1984-85	4,050.74	6,807.59	28,694.96	7,767.03	658.67	47,978.99
	1972-73	4,048.28	5,956.04	20,723.66	44.70	0	30,772.68
Wheat	1984-85	3,061.22	1,549.88	16,486.23	8,585.38	0	29,682.71
	1972-73	3,231.40	2,373.99	21,070.15	8,885.80	0	35,561.34
Soybeans	1984-85	849.35	1,789.66	12,699.22	582.94	810.64	16,731.81
	1972-73	1,840.79	1,232.60	9,630.48	0	0	12,703.87

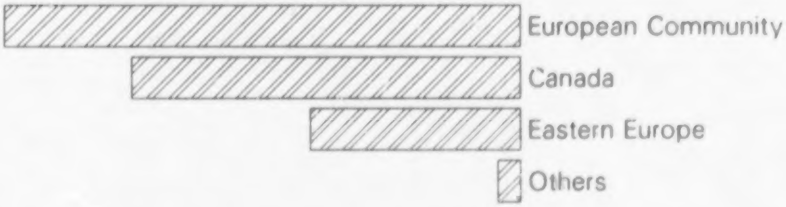
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain Market News* (Independence, Missouri); various issues.

Appendix IV. Flow Patterns Showing Sources of U.S. Pork and Beef Imports

Appendix IV. Figure 1. Relative Shares of Dollar Value of U. S. Beef and Veal Imports from Major Foreign Origins in 1984-85.



Appendix IV. Figure 2. Relative Shares of Dollar Value of U. S. Pork Imports from Major Foreign Origins in 1984-85.



Appendix V. U.S. Concessional Farm Product Exports by Commodities and Program Areas, 1977 and 1981-85 Fiscal Years

Appendix V, Table 1. U.S. Concessional Government-Financed Agricultural Exports by Commodities and Program Areas in Millions of Dollars, Fiscal Years 1977 through 1985.

Commodity and Fiscal Year (October-September)		PL-480 Title I Long Term Credit Sales	PL-480 Title II[a] Donations	Aid Mutual Security	Total[b] Government Programs	Concessional Program Exports as Percent of Total Exports
1985	Wheat and Flour	522.2	125.0	11.1	658.2	14.9
	Corn	19.9	38.6	54.6	113.0	2.0
	Soybean Oil	78.0	139.2	4.0	221.1	39.6
	Cotton (exc. Linters)	9.1	0.0	0.0	9.1	0.5
	Milk-Nonfat Dry	0.0	126.8	0.0	126.8	72.0
	Others	94.5	424.3	20.1	538.9	2.9
1984	Wheat and Flour	525.5	55.3	0.0	580.8	8.6
	Corn	53.3	20.4	92.3	166.0	2.4
	Soybean Oil	76.9	98.5	0.4	175.8	27.8
	Cotton (exc. Linters)	12.4	0.0	0.0	12.4	0.5
	Milk-Nonfat Dry	0.0	34.8	0.2	35.0	18.8
	Others	94.5	191.8	10.8	297.2	1.4
1983	Wheat and Flour	472.1	159.6	29.8	661.5	10.6
	Corn	75.3	10.2	47.5	133.0	2.3
	Soybean Oil	87.0	48.5	0.0	135.5	29.3
	Cotton (exc. Linters)	9.4	0.0	0.0	9.4	0.6
	Milk-Nonfat Dry	0.0	12.8	0.0	12.8	8.7
	Others	154.5	59.7	52.5	266.8	0.8
1982	Wheat and Flour	497.6	69.3	0.0	567.0	7.4
	Corn	36.1	9.0	38.9	83.9	1.4
	Soybean Oil	75.8	60.3	1.9	138.0	27.7
	Cotton	9.2	0.0	0.0	9.2	0.4
	Milk-Nonfat Dry	0.0	11.2	0.0	11.2	27.3
	Others	103.6	135.4	41.5	280.5	1.2
1981	Wheat and Flour	495.1	83.0	0.0	578.0	7.2
	Corn	78.3	30.9	57.0	166.3	2.1
	Soybean Oil	73.3	96.6	0.0	169.9	38.5
	Cotton	3.2	0.0	0	3.2	0.1
	Milk-Nonfat Dry	0.0	34.5	0.0	34.5	58.7
	Others	123.0	241.3	84.3	449.1	1.8
1977	Wheat and Flour	386.9	82.4	57.0	526.3	17.5
	Corn	44.8	5.5	142.3[c]	192.6	2.5
	Soybean Oil	69.3[d]	23.9	31.0	124.2	22.0
	Cotton	18.0	0.0	0.0	18.0	1.2
	Milk-Nonfat Dry	0.0	81.5	0.0	81.5	99.8
	Others	240.8	148.7	188.7	578.2	4.2

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1986 and various other issues.

[a] Donations include voluntary relief agencies, the World Food Program, foreign donations, and government-to-government donations.

[b] May not add due to rounding.

[c] Mutual Security shipments estimated from the relationship between corn and feed grain exports.

[d] Title I shipments estimated from the relationship between soybean oil and soybean and cottonseed oil exports.

Appendix V, Table 2. U.S. Concessional and CCC Financed Agricultural Exports in Millions of Dollars, Fiscal Years 1979 through 1985.

	Fiscal Year Ending September 30					
	1979	1981	1982	1983	1984	1985
Total Concessional Programs (from Appendix IV, Table 1)	1,490.1	1,401.0	1,089.8	1,219.0	1,267.2	1,667.1
CCC Programs:						
GSM-101	63.2	118.6				
GSM-102 (credit guarantees)		1,743.6	1,386.5	3,420.2	3,172.7	2,709.6
GSM-102 (blended credit)				648.9	473.6[a]	51.5
GSM-5 (interest-free loans for blended credit)						
GSM-201 (breeding stock loans)						
Total CCC Programs	63.2	1,862.2	1,386.5	4,069.1	3,646.3	2,761.1
Total Concessional and CCC Programs	1,553.3	3,263.2	2,476.3	5,288.1	4,913.5	4,428.2
Concession and CCC Programs as Percent of Total U.S. Agricultural Exports	4.9	7.5	6.3	15.2	12.9	14.2

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1986 and various other issues; U.S. Department of Agriculture, Foreign Agricultural Service, *Summary of Exports GSM-101; GSM-102; GSM-201; GSM-301*, unpublished material, December 1982; and *Notice to recipients. Summary of FY 83, FY 84, and FY 85 Export Values and Quantities* for GSM 102 and blended credit, unpublished material, September 1983, January 1985, and February 1986.

[a] Extra GSM-102 used for the blended credit program.